BUTANE-PROPANE News

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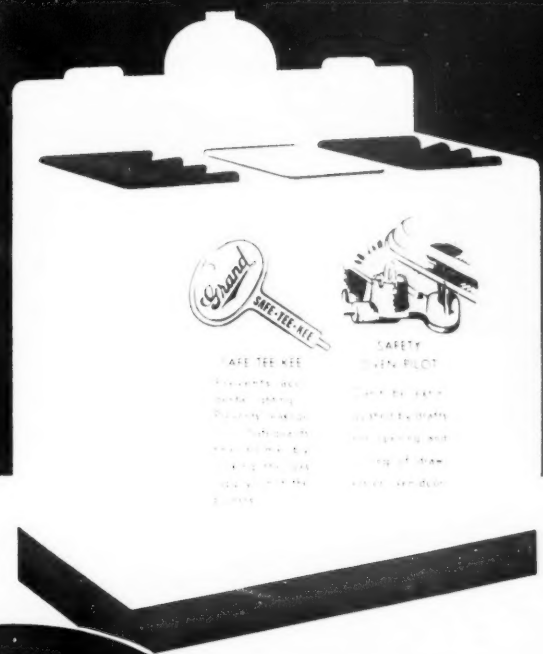

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AUGUST 1942

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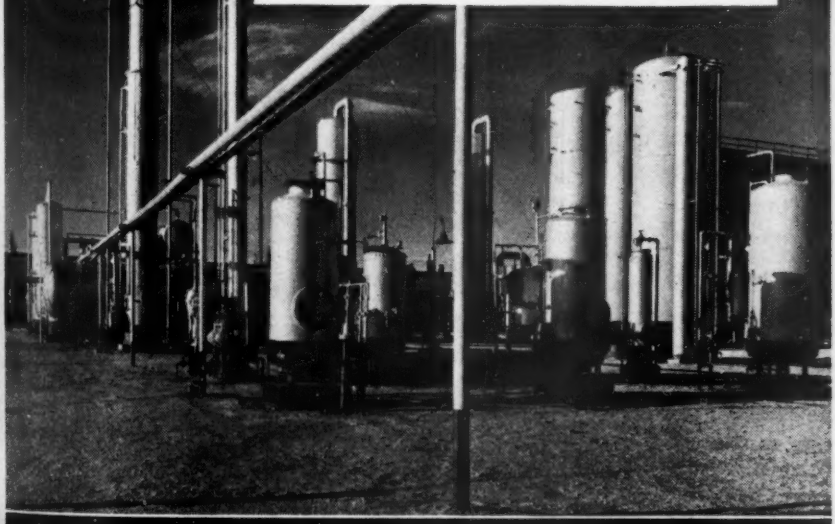

WARREN PETROLEUM CORPORATION

Tulsa, Oklahoma

BUTANE-PROPANE *News*

Reg. U. S. Pat. Off.

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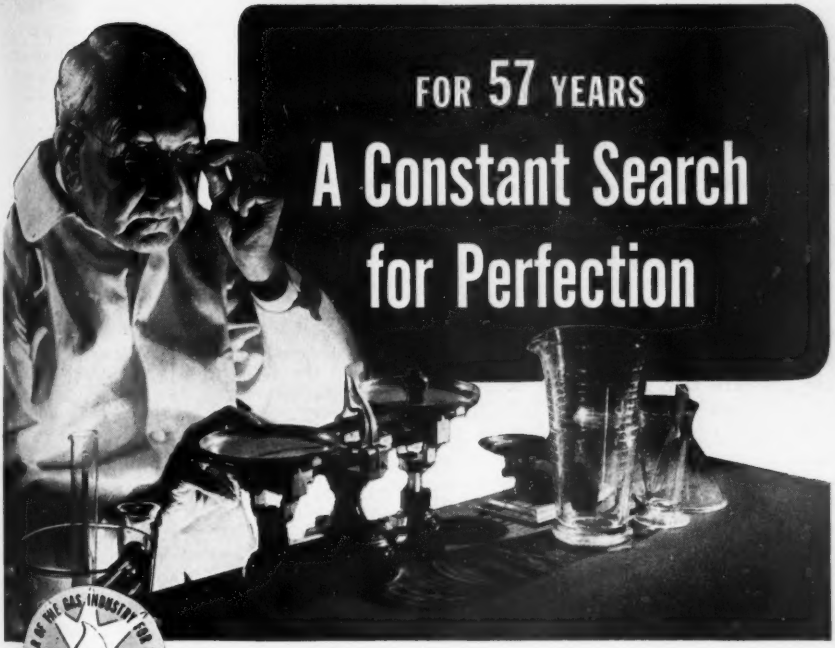

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LETTERS

Gentlemen:

There is a hospital in our territory that is a prospect for liquefied petroleum gas for heating, cooking and water heating. However, the directors want reports of actual installations of similar kind in other hospitals. Do you know of any such, or any dealers who have made that kind of installations and would furnish us with facts concerning the success and cost of operation and possibly some photographs? We will gladly pay for any reasonable expense in this connection.

J. S.

Nevada

We do not have any records such as you seek. Could some of our readers supply the information? Address in care of this magazine.—Ed.

•

Gentlemen:

Would it be practical or advantageous to use a butane-fired furnace in a forging plant instead of natural gas?

L. C.

Colorado

We do not think butane would have any advantage over natural gas in a forging plant. Each fuel should be equally serviceable and your choice probably should be determined by the best price that you can obtain on either gas. We believe that one will work just as well as the other.—Ed.

•

Gentlemen:

We would like to get a copy of the Regulations of the National Bureau of Explosives governing locations of aboveground bulk storage tanks for butane-propane gases.

We are especially anxious to know the distance required from the public highway and main line railroad track for such tanks.

F. P.

South Carolina

You can obtain a copy of the regulations you desire by writing to the National Bureau of Explosives, 30 Vesey St., New York City. Ask for circulars No. 17 and 17-B.—Ed.

•

Gentlemen:

Do you know of any commercial bakeries using travelling ovens heated with LP-Gas?

N. McM.

Illinois

Travelling, collapsible ovens are used to considerable extent in army camps. Usually there are cooking burners on top with the ovens below. We suggest you write to the G. S. Blodgett Co., Burlington, Vt., for more specific information.—Ed.

•

Gentlemen:

I would appreciate receiving literature, prices and general information in regard to using propane as a standby fuel for small industrial consumers.

G. S.

Pennsylvania

The information you desire can be had from the Ransome Co., Emeryville, Calif.; Gasair Corp., 155 Sansome St., San Francisco; Parkhill-Wade, 1625 South Alameda St., Los Angeles.—Ed.

•

Gentlemen:

Natural gas coming from an ordinary dry gas well contains the butanes, propane, ethane and methane. One fact among others I wish to learn is, if 1000 cu. ft. of gas containing butanes, propane, ethane and methane

is worth five cents for the manufacture of carbon black, what will be the worth or value of that 1000 cu. ft. for the manufacture of carbon black with the butanes and propane extracted?

In other words, what percentage of the actual carbon black value is removed from the gas when the butanes and propane are extracted therefrom?

S. R.

Oklahoma

It is impossible to answer your inquiriy without making an analysis of the gas in question, for different wells produce gases having differing percentages of hydrocarbon components.—Ed.

•

Gentlemen:

I would like some information on setting up and operating bulk plants for both propane and butane gas. Where could I get this information?

A. L. M.

Indiana

Among the advertisers in BUTANE-PROPANE *News* and the Third Edition of the Handbook BUTANE-PROPANE Gases will be found the names of engineering firms who install bulk plants and the names of fuel producers, any one of which can give you definite information upon your problem.—Ed.

•

Gentlemen:

Please tell me some of the important engineering factors that must be considered in adapting butane as a refrigerant for use in a truck that would also be run on butane. The job I have in mind would be used on long, continuous trips.

G. A. W.

California

There are a great many items of engineering design involved in the layout of an expansion coil system for use in heavy duty trucks. The following items, among others, are very important to assure a satisfactory and safe operation:

1. The expansion coil should be designed according to the A.S.M.E. or A.P.I.-A.S.M.E. code using the maximum pressure developed in the storage tank. The specifications for this design and the safety factors to be used are given in the National Board of Fire Underwriters Bulletin No. 58.

2. The area of expansion coil should be based on the average temperature difference of 10° F. or less.

3. It is recommended that an additional vaporizer be used for the automotive carburetor system. This device operates on controlled temperature of the engine water jacket and hence insures uniform quality of gas with consequently smooth operation of truck engine.

4. Semi-rigid tubing having maximum wall thickness is available for the expansion coil. Reference may be made to S.A.E. specifications for Type K. tubing. Brazed, welded or soldered sweated fittings are suggested on this application for resistance to vibration.

5. Performance curves of 1st stage and 2nd stage regulators are available from the manufacturer of regulators for butane and propane and should be used in designing the system.

6. The LP-Gas should be purchased on the basis of specifications including freedom from water content. The Natural Gasoline Association of America specifications for propane are the most rigid on this particular item.—Ed.

•

Gentlemen:

Because of the rationing of gasoline on the Atlantic Seaboard, a fleet of trucks which we operate is curtailed in its movements.

If we were to convert these trucks to butane would we be able to get fuel at all times?

A. K.

New York

Up to the present time there has been no intimation that there will be any curtailment of LP-Gas for automotive or other purposes in the eastern state. There are, however, general orders of the War Production Board which deny dealers the right to sell to any new customers the equipment necessary to change over a motor from gasoline to butane except when such customers are engaged in enterprises essential to the war effort.—Ed.

•

• **BUTANE-PROPANE *News* welcomes letters from our readers, but it must be understood that this magazine does not necessarily concur in opinions expressed.—Editor.**

Digging In For The War

By WALTER H. HOAGLAND
Technical Products Department, Shell Oil Co., Inc., New York City

WE of the liquefied petroleum gas business realize the vital part our industry has played in helping American families to a more self-sufficient and happier life. Now, for the first time in our association with that industry, we are faced with the problem of keeping all present equipment readily available and of holding to an absolute minimum the equipment scrapped in making repairs to other existing equipment. To do this and still provide the high quality of installation work upon which our collective reputations for good service are based, necessitates a thorough analysis of maintenance control.

Perhaps it is in order for all of us to give some concentrated thought to the preparation of a maintenance manual, listing in this manual the "don'ts" as well as the "do's," as a guide for service men in their routine daily work. Such a manual should be available to all service men at all times. Under the present particular and definite need for the conservation of equipment, a foundation manual covering maintenance could be started, to be revised currently, as new conditions arise.

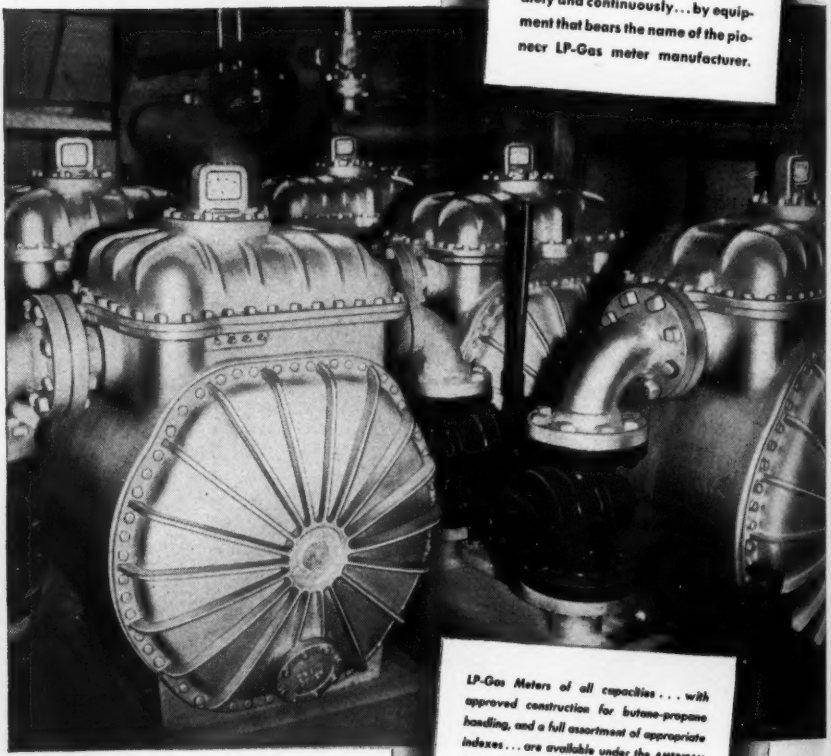
Whatever conservation course we choose to follow, the penalties for failing to utilize our present equipment to best advantage, especially in regard to maintenance, must inevitably be the lowering of our standards of customer service, with consequent risk of loss of those customers to others who prove to be more conscious of the need for maintaining good customer relations.

We must all dig in for the war effort and do everything in our power to reduce to a minimum the use of vital ferrous and non-ferrous materials in maintenance repairs. Since it is certain these materials will not be available for new non-war effort installations, upon the way we do this job will depend the extent to which we keep intact our principal source of income for the duration.

WALTER H. HOAGLAND
Guest Editor for August

A Battery Goes into Action at Camp Haan

In the propane plant at Camp Haan, in California, this battery of METRIC-AMERICAN Ironcase 500-B's is helping Uncle Sam keep both gas supply and accounts straight. • Each of these five busy meters (LP-Gas type) is handling better than its conservatively rated 10,540 cu. ft. per hr. capacity of propane, measured at 15 lbs. gage. The plant's propane delivery thus is measured accurately and continuously... by equipment that bears the name of the pioneer LP-Gas meter manufacturer.



LP-Gas Meters of all capacities . . . with approved construction for butane-propane handling, and a full assortment of appropriate indexes . . . are available under the AMERICAN and METRIC-AMERICAN brands. Helpful CATALOG LPG-4 mailed you at your request.

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MAINLY BEYOND THE MAINS

Inventory Relief

A form letter recently mailed by the LP-Gas Section of the WPB to the major producers of butane and propane and to the manufacturers of appliances and equipment used in the industry indicates that in the early future an industry inventory, as advocated in the July issue of BUTANE-PROPANE *News* will be undertaken. We reiterate our belief that it is essential that the LP-Gas Section be supplied with this information so that it may have on hand the figures necessary to correlate existing stocks of materials with the demands that will be made for their use in maintaining existing facilities and in supplying new service required by the war program.

Now another and even more important possible by-product of the inventory looms as a reason why it should be accorded the fullest and most immediate consideration by every factor whose fortunes are identified with the production and marketing of butane and propane. By law the RFC has been empowered to extend financial assistance in the form of loans at low interest to certain types of individual business enterprises where freezing orders on materials and stocks in inventory can be shown to threaten a condition of financial distress. But the RFC has ruled that before any single petitioner in an industry can be considered for such relief, it must first be established that the industry of which he is a part qualifies as one in which distress conditions exist.

No exact yardstick for measuring distress has been announced, but we assume that the amount and value of goods in frozen inventory, in comparison to the rate at which they can be permitted to move into essential uses, will be the prime criterion. The total figures as revealed by the WPB's LP-Gas inventory report should go far

toward establishing whether or not there exists or is threatened any general industry distress among butane and propane dealers and distributors.

In ascertaining the degree of potential distress that may exist in this industry, we believe that the RFC would be wise to take into consideration the relative size of the operations involved. Hundreds, perhaps even thousands of dealers, for instance, are newcomers in the field within the past two or three years. Their capital in relation to the stocks of materials that they have had to keep on hand has been necessarily small. Many have been living on expansion, financing the purchases of new supplies out of the quick installation of those already on hand. Such operators have in too many cases been caught with freeze orders just at the time when the built up load in gas was barely adequate to finance current operations.

We make no plea for any dispensation that would look to the saving of uneconomic or fundamentally unsound concerns. Casualties in every industry are part of the price of war; and for those whose excess of zeal or deficiency in business acumen have put them in an untenable financial position, we can only mourn in passing. But we are mindful of the fact that in this industry frozen stocks that might seem comparatively small in dollars and cents value are comparatively high in relation to capitalization, and to leave them immobilized on the dealers' hands is only to invite wholesale bankruptcy and the discontinuance of an essential fuel service to thousands of innocent consumers.

The war agencies of the government are aware of all this, and already the RFC is making inquiries to ascertain the possible effect of war restrictions on the LP-Gas industry. Where inventories are concerned it will look to the WPB, which is already setting the machinery in motion to inventory all industries of an essential nature.

Since a few dealers have attempted to secure individual consideration through the medium of letters to their Congressmen, and individual inquiries to the RFC we believe it well to advise the industry that these tactics are only a waste of time and postage. No relief has been granted and none will be granted until the industry status has been established. Such requests merely filter through to the WPB where they are all held in abeyance pending the decision of the RFC as to whether or not LP-Gas as a

whole is qualified for this relief.

Speedy and voluntary cooperation on the part of every producer, distributor and dealer will be the best guarantee that the claims of LP-Gas will be impartially reviewed and fairly considered in the light of the facts that the inventory report to the LP-Gas Section of WPB will disclose.

Fill the Tanks

It is gratifying to report that official fears of an imminent shortage of butane for commercial, industrial and domestic consumption have to a large extent subsided within the past few weeks. The transportation problem still bulks large, however, as next winter's bugaboo.

The officially inspired campaign to persuade users of oil burning heating equipment in the Eastern states to convert their furnaces to coal has been by no means a striking success. As a result all signs point to some form of rationing of oil for house heating purposes during the winter months.

This may well have repercussions in the form of an unusual winter demand for LP-Gas in those areas where the amount of fuel oil per household is curtailed. Many homes rely on propane or butane for hot water during the summer months, but after the start of the heating season throw the hot water load into a heating coil in an oil or coal furnace. With fuel oil rationed, many water heaters normally inoperative during the winter months will continue to draw from the gas tanks.

And it is well to remember that the old time practice of "taking the chill off" the kitchen by lighting the oven and leaving the door open for hours at a time is by no means a lost art.

As sound and prudent practice for every dealer and distributor having bulk storage facilities, we recommend filling tanks to capacity now, and keeping them full at all times, from now through the coming winter, against the day when transportation facilities may prove inadequate for the demand that will be made upon them. We believe also that in their contacts with customers using fuel oil for house heating, the dealers should actively advocate the conversion wherever possible of heating plants from oil to coal.

To those who show a natural disinclination to revert to the primitive use of an inferior fuel, it can only be pointed out that total war is not without its hardships, and even major inconveniences must sometimes be borne with cheerful resignation.

Rice Growers Use Butane To Solve Drying Problems

TO speed up rice drying so that the crop may be stored or shipped before early Fall rains set in, a northern California farmer has invented a butane-burning device that operates economically and is simple enough in design so that almost any grower can construct one without engineering assistance.

Hot air tunnels of either concrete or wood are constructed 30 in. high and as long as desired. If of wood, two layers are used, with paper between to make them air tight. The ground serves as the tunnel floor. Oblong holes eight by 20 in. are left in the top of the air tunnel. When a sack of rice is placed on one of these, the hole is completely covered. Heavy lumber separates the holes and supports the sacks.

Hot air is driven into the tunnels by a large blower and fan with a capacity of from 30,000 cu. ft. of air per minute up to 200,000. Temperature of the air is kept between 90° and 100°. Sacks usually

Drying tunnels through which hot air is blown on which sacked rice is placed. Temperature is kept between 90° and 100° and sacks are turned for fast drying. (Photographs through courtesy of "Sacramento Bee," Sacramento, Calif.)

A sack of rice removed from its position on the drying tunnel to show how heat reaches the grain.

are turned over to speed drying, particularly when moisture content is over 25%.

One farmer's drier has four tunnels each 100 ft. long with a total capacity of 608 bags. The blower has a capacity of 30,000 cu. ft. of air per minute. The blower is driven by a small tractor motor.

The process involves a principle of fanning heat from butane flame burners through the walled conduits. The sacks are laid on top and the warm air is forced through them. The upper part of the conduits are partitioned off and an opening is left just large enough to accommodate one sack. They are laid out in double rows.

The inventor is Elmer Davis, of the Trowbridge district, and last Fall saw the installation of a number of the driers in Yolo county.

Special burners for the butane gas are essential. In at least seven of the installations inspected last Fall, F. & E. LP-Gas burners were in use.

Rice with 20% moisture dries in about 10 hours.

Mr. Davis figures cost of drying by his method at about 10 cents per bag including hauling and stacking.

Moisture is removed at a rate of from .6 of 1% per hour to 1%. Mr. Davis recommends the lower figure to prevent rice from checking. Temperatures of 115° or over ruin head rice.

His rice drying plane which is 300 ft. long and about 10 ft. wide is covered and cost about $2500 for a concrete and wood structure.

It has a drying capacity of 600 bags and storage space for another 600. Temporary driers which are constructed entirely with wood can be made much cheaper.

The inventor says the rice drier is particularly useful to the small grower since he can dry any size lot at his own convenience and can do all his own work. The modern trend of rice harvesting is toward use of combines and drier, instead of windrowing and permitting the rice to dry in the field.

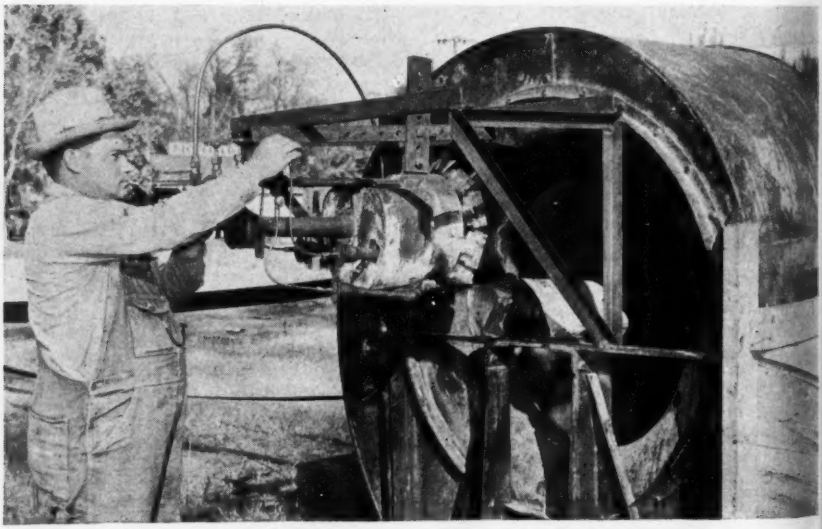
First came the combined harvester to replace the binder. This enabled the rice man to get the crop into sacks and move it off the field, but the moisture content was so great it damaged the kernels.

Then huge rice drying bins costing thousands of dollars made their appearance. They satisfactorily cured the crop, but two problems still confronted the growers. One was the cost of drying. The other was finding accommodations during the rush season.

Commercial driers charge an average of 17½ cents per 100 lbs. of rice and usually will not take lots smaller than 500 bags. Rice is unsacked for drying.

The handling of rice by combined harvester is increasing in the Sacramento Valley, but due to the scarcity of dryers its spread has been retarded. Growers prefer the combine method, but because of the moisture content of the rice, drying is a necessity. With the recent innovation many see for the rice industry a new, practical device bringing important changes.

The drier may also be used for corn, beans and nuts. Need for drying has kept the corn crop in the state at a minimum.



Close-up of fan which circulates air heated by butane burner.

It's the Fire That Matters—
NOT THE FIRE BOMB

By WILLIAM H. EASTON
Safety Research Institute, Inc., New York City

IN planning their defenses against incendiary air raids, producers, distributors, and large users of liquefied petroleum gases have, as their major problem, the provision of means for promptly extinguishing any fires that might be started on their premises by fire bombs.

WM. H. EASTON

In most cases, fortunately, because of the thickness of the tank shells, the problem of penetration of large storage tanks by bombs presents few difficulties. As shown by Table 1, which was prepared by the U. S. Chemical Warfare Service, certain types of containers are strong enough to withstand the impact of the ordinary fire bomb and others are so located that they have ample protection.

The cylinders and small underground tanks, used in domestic and industrial installations scattered over the country, do not present the same problems as the large bulk installations. Even cylinders with the thinnest shells are probably strong enough to resist glancing hits, and the chances of a bomb striking so small an object squarely are too small to warrant special precautions.

The bomb itself, therefore, is really of minor importance. In most cases, it falls where it can do no particular damage; but, when it does start a fire, the fire must be instantly put out by men on the spot, or the consequences may be the destruction of the storage, the plant, and even the community.

To secure the right kind of fire protection, the fire hazards of the plant must be carefully studied, sufficient fire-extinguishing equipment of the proper types must be available, and every able-bodied man in the place must be trained in fire fighting.

In planning this protection, incendiary fires should be thought of as being made up of two parts—the part that is right around the burning bomb, and all of the rest

TABLE I.
MINIMUM THICKNESSES OF MATERIALS TO RESIST PENETRATION BY 2.2-lb. MAGNESIUM INCENDIARY BOMBS

Material	*Thickness—Inches*
Mild steel plate.....	¼
Shingles—wood, slate, or composition.....	6
Sand or earth coverage	6
Reinforced concrete..	4

of the blaze. This point is of importance because only what may be called "bomb-fire" requires special treatment. The rest of the fire is just an ordinary fire and should be fought in the regular way with anything that will put it out.

If burning gas forms part of the bomb-fire, the gas supply must be shut-off to prevent re-ignition. The bomb is then disposed of by spraying it as described in the article entitled "To Defeat Air Attack Dangers," which appeared in the July issue of BUTANE-PROPANE *News* (Page 50).

If the gas supply cannot be shut off immediately, the fire must be allowed to burn, while its surroundings are protected, if necessary, by keeping them cool with water, and the bomb is sprayed to get rid of it. For cooling purposes, sprinklers and hose streams serve best, but either or both systems may be put out of commission during an air raid. The most satisfactory substitute is a battery of pump-tank fire extinguishers which can be kept in continuous action with the aid of a well organized bucket brigade.

Close-up of foam on a magnesium bomb. Occasionally little spurts of metal break through the foam blanket, but not to any dangerous extent. That foam blanket is very effective in smothering flammable liquid fires.

If a flammable liquid is involved in a bomb-fire, the most effective weapons to use are either foam or loaded-stream types of fire extinguishers because either will kill the fire in the liquid and will also speed up the burning of the bomb. Vaporizing-liquid and carbon-dioxide types of fire extinguishers can be used with excellent effect on outlying fires in flammable liquids, but it is a waste of ammunition to use them on the burning bomb because they are not effective on burning magnesium and cannot prevent re-ignition of the liquid. However, after the bomb has been disposed of, they can be used without restriction.

Much has been said about the formation of dangerous gases when vaporizing liquid or carbon dioxide fire extinguishers are used on burning magnesium. The small amounts of such gases that may be formed in the use of these extinguishers are unlikely to cause any ill effects, if the fire fighters take normal precautions to avoid breathing the products of combustion. As a matter of fact, all fire gases are toxic and it should be standard practice to avoid breathing smoke and to ventilate thoroughly after extinguishing a fire by any means. The important point is that the vaporizing liquid and carbon dioxide extinguishers do not contain water

and therefore are not effective on incendiaries.

When the bomb-fire is in wood, paper, textiles, or other ordinary combustible materials, one fire fighter should dispose of the bomb, using a hose or any of the water-type fire extinguishers—soda-acid, foam, pump-tank, loaded-stream, or anti-freeze — while other workers combat the outlying fire, using any available extinguishers, including the vaporizing liquid and carbon dioxide types.

Should the bomb fall into live electrical equipment, the current should be turned off immediately. Then the bomb and the fire can be fought as in the case of ordinary combustibles, without endangering the fire fighter. If the current cannot be turned off, the bomb should be dislodged, if possible, and the fire fought with vaporizing-liquid or carbon-dioxide extinguishers. If the bomb cannot be dislodged, the outlying fire can be fought with these same weapons, while the bomb is permitted to burn itself out.

In the event of an air attack, the safety of the community and of our industries will depend largely upon the efforts of well-trained and well-equipped civilian fire fighters. It is, therefore, essential for the liquefied petroleum gas industry to perfect its fire defenses during the present emergency, but, when peace comes, these same defenses should be maintained intact. Fire is a public enemy at all times, and every unit of an industry dealing with fire hazards should always be able to protect itself and its neighbors from them.

Women's Defense Organizations Use Mobile LP-Gas Equipment

New LP-Gas equipped mobile food units have recently been put into service by several leading women's defense organizations.

In Seattle, Wash., the Seattle Soroptimist Club, composed of 100 women, recently donated an LP-Gas-fired mobile canteen unit to the Red Cross Motor Corps, which is under the chairmanship of Mrs. Louis Marks. Dr. Lilian C. Irwin, president, Seattle Soroptimist Club, presented the unit to Miss Ada Colmary, chairman of the Red Cross canteen service and Lew V. Day, chairman of the Seattle chapter.

The streamlined, all-steel trailer, which will transport and serve hot foods, is completely equipped with three large butane gas burners, a built-in 27-gal. water tank and new type thermos containers. Valued at more than $500, the "mobile canteen" was based on an original design by Chester Weidener, civilian war aid officer of the Seattle-King County Chapter, American Red Cross, and was built by the George Heiser Co.

In Pasadena, Calif., the Women's Auxiliary Fire Department has organized a committee which will operate a butane-equipped "coffee car" in case of an emergency. Divided into two squads with one squad always on call, the women can roll the fully equipped coffee car to the scene and within 10 minutes serve steaming cups of coffee to tired rescue workers. All members of the committee are trained in first aid and the car carries full first aid equipment. The car is equipped with special blackout lights so that its facilities can be used without showing a directing light to any raiding plane.

Latest News From Washington

GRADUALLY the uncertainties which beset the LP-Gas industry at the opening of the war have given way to order and understanding as governing rules have been established and generally known. But news of interest to dealers and distributors continues to come from Washington, as evidenced by the following items:

Price Ceilings for Services

Price ceilings — safeguard to the housewife and the business man against an inflationary rise in the war-time cost of living and of doing business—were extended July 1 to retail services, the third major step in the application of over-all price control.

Ceilings established by Maximum Price Regulation No. 165—Consumer Services—set a top limit on charges for virtually all services to the ultimate retail consumer in connection with a commodity. The ceilings are designed to hold maximum prices for the $5,000,000,000 retail service industry generally at levels of last March.

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Priority Assistance

A new service for applicants for priority assistance who use individual PD-1A certificates was announced July 7 by J. S. Knowlson, Director of Industry Operations.

If applicants will enclose with their application blank a self-addressed post card, the case number assigned to their application will be stamped on the card, and it will be returned to them to facilitate handling of subsequent inquiries with respect to the application. All inquiries concerning applications should be submitted in writing.

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Construction Equipment Survey

A survey of all construction equipment owned by highway departments of the various states, cities and towns was completed June 29 by the Bureau of Governmental Requirements, and is now available for use by all Government agencies.

The survey lists 34 types of equipment, with details as to age and condition. Many governmental agencies have already found the survey helpful in locating equipment which can be leased or rented by one highway department to another for important war work.

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P-46 Modified

The War Production Board acted June 24 to expedite the extension of utility services, such as gas, electricity and water, to thousands of war housing units throughout the country.

Under an amendment to P-46, utility extensions to housing projects are assigned the same preference rating as are assigned to the housing projects themselves. Heretofore extensions to housing projects were specifically excluded from the automatic rating assigned by P-46.

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Amendment to L-23-c

A provision of Order L-23-c on domestic cooking appliances, requiring that permitted type gas ranges conform to certain safety and performance specifications, was revoked

July 4 by the Director of Industry Operations.

This action, embodied in Amendment No. 1 to the order, was taken because it was found that the specifications in some cases did not result in the saving of materials.

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Butadiene Under Allocation

Butadiene, basic ingredient for the manufacture of Buna-type synthetic rubber, was placed under allocation from producers June 27 by the Director of Industry Operations with the issuance of Order M-178, effective July 1.

Producers seeking to deliver and persons asking delivery of butadiene are required to make application to the Director of Industry Operations, Reference M-178. They are requested to use Form PD-33, which covers the production and shipment of all chemicals used in the manufacture of synthetic rubber.

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Scrap Salvage Campaign Begins

A new and greatly intensified nation-wide salvage program, designed to reach into every home and industrial plant and increase the flow of all vital scrap materials to the country's war plants, was announced on July 1.

The overall campaign started formally on July 13, immediately after the completion of the scrap rubber campaign.

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One Utility to Another

A utility company may sell materials from excess stocks or inventories to any other utility company or war production plants, provided the order for such materials carries a preference rating of A-5 or higher. This is provided for in Amendment No. 2 to P-46, announced July 9.

CLASSIFICATIONS AND SUMMARY OF PRINCIPAL ORDERS AFFECTING THE PLUMBING AND HEATING INDUSTRY

Division	*Order No.*
Plumbing and Heating Product Limitation Orders	
Coal Stokers	L-75
Domestic Cooking Appliances and Heating Stoves	L-23-b & c
Furnaces	L-22
Metal Household Furniture (Includes Radiator Covers and Under-sink Cabinets)	L-62
Oil Burners	L-74
Simplification of Plumbing and Heating Products	L-42
Distribution Orders	
Plumbing and Heating Distribution	L-79
Suppliers' Inventories	L-63
Construction Orders	
Defense Projects	P-19
Defense Housing Projects.	P-55
Limitation on Construction	L-41
Remodeling for Defense Housing	P-110
Repair and Maintenance Orders	
Farm Machinery and Equipment	P-95
Industrial, Institutional, Governmental	P-100
Plumbing and Heating	P-84
Utilities	P-46
Fuel Conservation Orders	
Coal and Coke	M-97
Fuel Oil	L-56
Liquefied Petroleum Gas	L-86
Natural Gas	L-31
Miscellaneous	
Farm Machinery and Equipment Limitation Order	L-26
Manufacturer's Report on Metal Requirements	PD-275

Millions for Rubber Plants

Announcements from executives of companies involved indicate that some $85,000,000 will be spent for synthetic rubber plants and supply sources to be completed in the Los Angeles Basin before March 1, 1943.

W. S. Harmon, project engineer of the Firestone Tire and Rubber Co., first revealed the proposed plant construction program early this month. Earlier it had been announced that Shell Chemical Co. was building a $15,000,000 butadiene plant. Other subsidiary plants, Dow Chemical Co., and Southern California Gas Co., will supply the necessary styrene. Options on the location have been taken through the Defense Plant Corp.

A still later announcement comes from the Goodyear Tire and Rubber Co. stating that it has assumed an important role in the Los Angeles Basin synthetic rubber plants projects.

Cost of the Firestone construction was announced as $30,000,000, and the Goodyear plant, $40,000,000.

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Transportation Relief

If the owner or operator of a motor truck feels that compliance with the provisions of Orders Nos. 3, 4, 5, or 6 of the Office of Defense Transportation is impossible or works a great hardship upon him, he may now apply for a special permit for relief. If granted, this permit will constitute an exemption as set out.

For this purpose a new form has been issued. It is known as MT-1, and supersedes the 3A application form previously issued. Copies may be obtained from the nearest field office of the ODT, a list of which is given herewith.

Applicants may appeal decisions of field managers by asking for reconsideration from John L. Rogers, Director of the Division of Motor Transportation, ODT, Washington, D. C.

LIST OF ODT FIELD OFFICES

Albany, N. Y.
Lawrence F. McDonald; Room 1122-A, 112 State St.

Atlanta, Ga.
John G. Galey; 1322 Candler Bldg.

Baltimore, Md.
Melvin R. Greene; 917 Munsey Bldg.

Billings, Mont.
Emmett Fogarty; 302 Securities Bldg.

Birmingham, Ala.
W. E. Duncan; 917 Comer Bldg.

Boise, Idaho
Maurice H. Greene; 426 Idaho Bldg.

Boston, Mass.
Eli C. Benway; Room 527, 80 Federal St.

Buffalo, N. Y.
Floyd B. Piper; 1505 Genesee Bldg.

Charleston, S. C.
Wm. B. Love, Jr.; 36 Broad St.

Charlotte, N. C.
Lafayette R. Stallings; 1409 Liberty Life Bldg.

Chicago, Ill.
Harry Gormley; 1905 Civic Opera Bldg.

Cincinnati, Ohio
Henry A. Leachman; 906 Union Trust Bldg.

Cleveland, Ohio
C. R. Allen; 1440 Standard Bldg.

Columbus, Ohio
Donald T. Maentz; *311 Old Post Office Bldg.

Dallas, Texas
S. Joyner Cole; 704 Santa Fe Bldg.

Davenport, Iowa
Paul V. Kortkamp; 704 Kahl Bldg.

Denver, Colo.
E. Robert Baker; 407 Denham Bldg.

Des Moines, Iowa
John H. Gillespie; 408 Crocker Bldg.

Detroit, Mich.
J. Robert Cooper; 1116 Penobscot Bldg.

El Paso, Texas
Frank N. Lanotte; *103 Federal Bldg.

Fargo, N. D.
W. H. Thompson; 508 First National Bank Bldg.

Hartford, Conn.
John F. Maerz; 624 Capitol National Bank Bldg.

Houston, Texas
J. R. Quattlebaum; 614 Federal Office Bldg.

Indianapolis, Ind.
George F. Burnett; 809 Circle Tower Bldg.

Jacksonville, Fla.
Herbert E. McDaniel; 705 Lynch Bldg.

Kansas City, Mo.
J. Herman Hoffman (Acting); 307 Bonfils Bldg., 1003 Walnut

Little Rock, Ark.
W. R. Atkins; 153 Federal Bldg.

Los Angeles, Calif.
Roy Long; 955 Western Pacific Bldg.

Louisville, Ky.
F. S. Crawford; 31 Kenyon Bldg.

Memphis, Tenn.
R. T. Lawrence; Room 1510, 81 Madison Bldg.

Milwaukee, Wis.
Russell R. Lynch; 828 N. Broadway

Minneapolis, Minn.
Frank T. Corcoran; 226 Midland Bank Bldg.

Nashville, Tenn.
Victor E. Nichol; *222 U. S. Court House

New Orleans, La.
Frank C. Biggs (Acting), 1852 Canal Bldg.

New York, N. Y.
William J. Clark; 122 E. 42nd St., 1520 Chanin Bldg.

Norfolk, Va.
Maclin Simmons; 609 Bankers' Trust Bldg.

Oklahoma City, Okla.
William W. Warren; 336 Key Bldg.

Omaha, Neb.
V. J. Hons, *802 Woodman of the World Bldg.

Philadelphia, Pa.
Everett Harding; 1101 Gimbel Bldg.

Phoenix, Ariz.
William M. Cox; 305 Security Bldg.

Pittsburgh, Pa.
Charles T. Walker; 534 Fulton Bldg.

Portland, Ore.
Herman Sites; 609 Bedell Bldg.

St. Louis, Mo.
A. D. Mason; 1007 Boatmen's Bldg., 314 N. Broadway

Salt Lake City, Utah
Richard W. Candland; 1202 Continental Bank Bldg.

San Antonio, Texas
John G. Ross; 827 Majestic Bldg.

San Francisco, Calif.
W. B. Grummel; 531 Monadnock Bldg.

Seattle, Wash.
Harold C. Arnet; 5529 Stuart Bldg.

Shreveport, La.
John F. Dawson; 922 Giddens-Lane Bldg.

Spokane, Wash.
Holley I. Smith; 607 Hutton Bldg.

Toledo, Ohio
H. Martin Walker, 415 Security Bank Bldg.

Wichita, Kan.
W. R. Bartling; 220 Federal Bldg.

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* Temporary Address: c/o Interstate Commerce Commission.

Home Volunteer Movement

Stating that in this war emergency, when restrictions and the rationing of food has a definite bearing on civilian morale and the maintenance of good standards of living, the help of expert technicians in these fields is especially valuable, Servel, Inc., has announced the appointment of J. Ernestine Becker as head of its new Home Volunteer Advisory Board. Miss Becker, B.S., M.A., is Associated in Biochemestry at the School of Hygiene and Public Health, John Hopkins University, Baltimore, Md., and collaborated with Dr. E. V. McCullum in the writing of "Food, Nutrition, and Health," which is the recognized authority on these subjects.

Servel, Inc., at the suggestion of a number of gas companies, has developed the proposed program for Home Volunteer service which is intended to throw the entire strength of trained gas company employes into a campaign to show the women of the United States how to apply in their own homes the principles of conservation and nutrition recommended by the Government.

The program, as finally assembled by the Consumer Service division and the Home Economics division of Servel, presents consumer aids and materials for the execution of a complete promotional activity by gas companies.

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Air Raid Warden Equipment

E. D. Bullard Co., 275 Eighth St., San Francisco, Calif., has issued a free leaflet describing personal protective equipment recommended for air raid wardens, and some items, such as air raid sirens, for plant protection. Recommendations are based on information supplied by civilian defense authorities and the experience of the city of London. The leaflet shows the equipment necessary for groups of 25-50, 50-100, and 100-200 people, or for each floor of a building, and lists prices to help the purchaser determine the investment necessary to protect adequately his property and employes.

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Valves and Fittings

Among the list of "scarce materials" for which substitutes are suggested for priority rating applications for the WPB by the Office of Petroleum Coordinator are valves and fittings which are trimmed with chromium, stainless steel, bronze, brass or nickel, except to meet special processing requirements. Valves over 2 in. with brass bodies are usually prohibited.

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Director for Three States

Harry H. Fair, of San Francisco, has been named regional director of the War Production Board.

The San Francisco Region includes California, Arizona and Nevada, and all field offices in these three states will be directly responsible to the San Francisco regional office.

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N.F.P.A. Issues Book On Fire Defense

The National Fire Protection Association has issued a book entitled "Fire Defense," a copy of which it is recommended, should be in the hands of every operator of a gas plant.

The book contains authoritative information and recommendations on dealing with air-set fires, bombs and sabotage, civilian defense, fire fighting and safe-guarding industrial production for defense.

The price of "Fire Defense" is $1.50 per copy and can be had from the N.F.P.A. at 60 Batterymarch St., Boston, Mass.

SELLING

Water Heater Servicing

In these days when selling campaigns are operating in reverse, dealers will welcome constructive ideas for maintaining service departments on a profitable basis and for building customer relations that will reflect favorably upon future sales when the war ends.

A plan developed by the Southern California Gas Co., Los Angeles, is directed to owners of gas water heaters and is supported by newspaper advertising to create general interest; a specially designed free booklet showing the numerous uses for hot water in the home; a direct mail solicitation urging users to invite an inspection of their water heaters and, finally, a chart upon which the visiting service man can indicate the exact conditions of the water heating service as inspection reveals.

The form of the chart follows:

CHECK CHART
SURVEY FACTS CONCERNING YOUR PRESENT WATER HEATING SERVICE

Name .....
Address .....
Date .....
C.O.D..... Charge.....
Type of Building.....
Owner: Yes..... No.....
Make of Heater.....
Trade Name .....
Serial No..... Size.....
Type of Heater:
Instantaneous .....
Storage .....
Booster .....
Year Installed .....
Adequate Capacity:
Yes..... No.....
Location: Closet.....
Basement..... Kitchen.....
Other .....
Location is Cause of Excessive Heat Loss: Yes..... No.....

Checked

1. Faucets for Leaks..... ☐
2. Faucets for Loose Washers ☐
3. Water Hammer (shock pressure) ..... ☐
4. Number of Hot Water Faucets ..... ☐
5. Hot Water Pipes for Leaks ☐
6. Fixture Drain Stoppers.... ☐
7. Water Pressure: Excessive Yes..... ☐ No..... ☐
8. Cold Water Inlet Valve.... ☐
9. Main Gas Valve to Heater ☐
10. Pressure Relief Valve..... ☐
11. Shower Connections for By-Pass ..... ☐
12. Heater for Lime Deposits.. ☐
13. Vent for Condensation..... ☐
14. Draft Conditions ..... ☐
15. Main Burner Flame..... ☐
16. Pilot Adjustment ..... ☐
17. Pilot Location ..... ☐
18. Water Temperature ___° Fahr.
19. Automatic Pilot Yes ☐ No ☐
20. Heater Vented..Yes ☐ No ☐
21. Proper Draft Hood Installed ☐
22. Roof Caps ..... ☐
23. Type of Tank:
    a. Full Floating ..... ☐
    b. Flue ..... ☐
24. Thermostat Location:
    a. Side ..... ☐
    b. Bottom ..... ☐
25. _____
26. _____

Work Performed

1. Installed Washers..Number ☐
2. Installed Valve Seats " ☐
3. Cleaned Main Burner Ports
   Yes..... ☐ No..... ☐
4. Cleaned Heating Surface
   Yes..... ☐ No..... ☐
5. Cleaned Pilot..Yes ☐ No ☐
6. Cleaned Thermostat
   Yes..... ☐ No..... ☐
7. Adjusted Thermostat
   Yes..... ☐ No..... ☐
8. Inspected Water from
   Heater .....Yes ☐ No ☐
   Clear .... ☐ Rust ..... ☐
   Sand .... ☐ Lime ..... ☐
9. _____

If the original guarantee on this water heater has previously expired, this check-up does not constitute a re-guarantee for any future life of the appliance.

Signed _____
(Firm Name)

By_____
(Plumber or Service Man)

The plan and other check charts could suitably be extended to—cooking ranges, space heating units and refrigerators, serving the consumer beneficially, providing a source of immediate income for the dealer's service department, and laying the foundation for many future sales.

You Can Still Sell

Selling, as practiced in the past, is obsolete since limitation orders have curbed production and the usual retail outlets. But, there is selling to do!

Primarily, the market now lies with war activities. These include many industries in outlying districts where no other fuels than propane and butane are adequate or available. In such cases new installations are possible when the proper procedures are followed. Affecting orders and forms for exceptions have appeared in recent issues of BUTANE-PROPANE *News*.

Restaurants and roadside stands which serve meals to war workers may be sold, as also may the many housing projects erected for service men and defense workers.

Those concerned in the production of foodstuffs, which includes farmers, may be granted the necessary exceptions when their needs are properly presented.

Worn out equipment may be replaced with new in all homes when repair is impossible or inexpedient, and newly established homes without gas facilities may receive installations unless less critical equipment can be substituted.

Always, the dealer is permitted to make necessary repairs—and that's a selling job, too, many times requiring much ingenuity.

And lastly, there is a selling job more important than all others, probably. It consists in keeping the industry sold to the public during this period of comparative non-expansion. Present consumers must be given a character of service that will keep them satisfied—more, enthusiastic. Non-users must be continually told of the merits of propane and butane, and foundations laid for sales in the future.

Some dealers will do this through personal contact; others by consistent advertising. Whatever the means, no dealer can afford to so relax his efforts that any competitive fuel will supplant in the public mind the place that liquefied petroleum gas has won for itself in these recent years of unexcelled performance and remarkable growth.

THE BOTTLED GAS MANUAL

Chapter 13 Making Appliance Conversions

THERE was a time in the automotive industry when the so-called "natural mechanic" was in his glory. He never used a thickness gage, micrometer or caliper. He fitted rings and pistons by sight and "feel." He could work seeming wonders with a monkey wrench, pliers, screw driver, and hammer. He would have been insulted if you had suggested that he set the spark plug gaps at .025 in. with a gage. This would have been a reflection upon his "natural" ability!

The modern automobile with its micro-adjustments sent this fellow into oblivion along with the horse and buggy, but in the early days of our industry he had his counterpart in the liquefied petroleum gas service man. Progress in the design of appliances along with increased knowledge at our command is rapidly driving his like into oblivion again, but a few are still hanging on. He is the fellow who uses an ice-pick to enlarge orifices and relies upon his eye and personal opinion as to when a job is right. The burners on a range so converted by him present all of the variations attributed to the proverbial coat of Joseph with its many colors and the housewife has the entertaining diversion of experimenting with several burners of unlike characteristics, beside the privilege of paying unnecessarily high gas bills.

Facts Which Must be Known in Making Conversions. There are four questions which we must first answer before attempting to make any conversion, and we must know the answers in the order given.

A. What should be the input to accomplish the desired results?

B. Can the burner be converted?

C. Can it be placed in the proper position to operate economically?

D. Will the conversion be economical and satisfactory in operation?

Let us analyze each of these questions and find the method of obtaining correct answers.

What Should Be the Input? In many instances this question is answered for us in the recommendations of the American Gas Association. In other instances the answer will be found in the customary practices of the manufacturers (see Tables 1 and 2.) There are instances where special inputs must be provided because of requirements peculiar to a particular job or the demands of the customer. Let us take a specific example: The customer demands that a range top

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• The Bottled Gas Manual series by C. C. Turner, started in the July, 1941, issue of BUTANE-PROPANE *News* and will continue to be published monthly in chapter form until completed. This series constitutes a valuable text book and field manual that should be invaluable to everyone in the liquefied petroleum gas industry.—*Editor.*

burner shall be able to bring two quarts of water from a 40° F. temperature to the boiling point in 10 minutes. What should the input be?

For the moment let us forget about efficiencies and determine the actual amount of heat required to do the job. We know that water weighs 8.345 lbs. per gal., and that two quarts of water are ½-gal. The weight of the water to be heated is therefore $\frac{1}{2} \times 8.345 = 4.17$ lbs.

The temperature rise desired is $212 - 40 = 172°$.

The specific heat of water is 1. Therefore:—

$172 \times 4.17 \times 1 = 716$ B.t.u. required in 10 minutes time.

Ten minutes time is 1/6th of an hour, so the hourly rate of input would be $6 \times 716 = 4300$ B.t.u. per hour.

This 4300 B.t.u. per hour is the actual rate of flow per hour required to raise the temperature of the water 172° in 10 minutes time, but we have not yet given any consideration to the efficiency of the burner. This matter of efficiencies is a variable, dependent upon factors of design and adjustment and shape of utensil used. The *minimum acceptable efficiency* of a range top burner is 45%, but in actual practice efficiencies in the neighborhood of 75% have been obtained. We should not, however, pay ourselves the compliment of being so expert that we can obtain such an unusually high efficiency as 75%, so we will base our maximum input upon a minimum acceptable efficiency factor of 45%. In other words, this input of 4300 B.t.u. per hour is just 45% of the input for which we are going to design our burner. 100% would be $4300 \times 100/45 = 9560$ B.t.u. per hour.

Let us take a less conventional problem in which we are required to melt 10 lbs. of lead in 10 minutes time starting from a temperature of 80°. The specific heat of lead may be taken as .0306 and its melting point as 621° F., its latent heat of fusion as 9.67. (See Table of Specific Gravities, Specific Heats, Latent Heats of Fusion and Vaporization in Chapter 3.)

To raise the 10 lbs. of lead from 80° to 621° it will require $(621-80) \times 10 \times .0306 = 165.54$ B.t.u.

To melt the 10 lbs. of lead after a temperature of 621° is reached will require $10 \times 9.67 = 96.7$ B.t.u.

The total amount of heat to be absorbed by the lead in 10 minutes time would be $165.54 + 96.7 = 262.24$ B.t.u. which calls for an hourly input of $6 \times 262.24 = 1573.44$ B.t.u.

When we come to the efficiency factor in this problem we arrive at a variable upon which we must use our judgment. Lead pots are not insulated as a rule; they are apt to be required to operate out on the job under adverse draft conditions. Because of this I would not count on an efficiency of over 20%. The total input would therefore have to be $1573.44 \times 100/20 = 7867.2$ B.t.u. per hour.

From the foregoing we can bring home to ourselves one important fact. In this matter of efficiencies we must use our judgment, and we must be conservative. If we err in

the direction of too great input we can cut down on the orifice size or regulate the input by manipulating the gas cock. If our error is in the opposite direction we may have to start all over again and build a complete new burner; this costs money and is irritating to the customer. Let's be conservative, always, in this matter of burner sizes.

Customary Burner Inputs. Table No. 1 which shows customary burner inputs is not based upon the recommendations of the American Gas Association, but upon what I have found to be the common practice of American manufacturers of propane appliances. We should, wherever possible, be guided by the recommendations of the Association, and these may be obtained by writing them. As several factors of design enter into these suggestions it does not seem practical to include them here, and space does not permit it, but my advice to you is, procure them and be guided by them wherever possible.

Broiler Inputs. In converting a broiler burner one is necessarily limited by the construction and design of the burner, but for satisfactory results wherever possible the input should be figured in accordance with the following equation:

$$B = D \times W \times 49.$$

In the above equation:—

B = Input in B.t.u. per hour.

D = Depth of broiler space in inches.

W = Width of broiler space in inches.

49 = A constant which is arrived at by the theory that the broiler input should be 140 B.t.u. for each square inch of broiling area and the observation that in practice the broiling area is 35% of total broiler space.

$.35 \times 140 = 49.$

Oven Inputs. It is customary to provide an input of 8000 B.t.u. per cu. ft. of oven space for ovens of less than 2.4 cu. ft. capacity and 10,000 B.t.u. per cu. ft. of oven space for ovens of greater size. If the oven is equipped with a thermostat (as it always should be on a

TABLE 1. CUSTOMARY DOMESTIC PROPANE BURNER INPUTS

Description of Burner	*Customary Input in B.t.u. per Hour*
Standard range top burner	5590
Giant range top burner	6870-10340
Simmer burner	1030-1300
Broiler burner (see special equation for figuring)	18000-20000
Oven burners (see special equation for figuring)	18000-20000
Conversion water heaters	5000-10000
Storage water heaters:	
Slow recovery, 30 gal. size	5000-7500
Medium fast recovery, 30 gal. size	14000-16000
Fast recovery, 30 gal. size	20000-40000
Side arm tank heaters	24000
Average mantle gas light	1837
Gas refrigerators (manufacturer's rating should be strictly adhered to)	2100-3750

propane range) it is customary to increase these inputs by 10%, the theory being that the additional input will allow for faster preheating of the oven, and after the desired temperature is obtained the input will be regulated by the thermostat. Table 2 of oven inputs is based upon these practices and theories. Table 3 shows customary commercial and industrial propane burner inputs.

Can the Burner Be Converted? Having determined the desired input we can now decide whether or not the burner can be converted. Our procedure is as follows:

A. *Spacing of Ports.* We should determine whether or not satisfactory entrainment of the flame from port hole to port hole requires the drilling of additional port holes. (See table, "Recommended Spacing of Port Holes on Centers" in Chapter 12.)

B. *Total Number of Port Holes.* This is the actual number of holes already drilled in the burner plus the additional port holes which must be drilled for proper entrainment.

C. *Input per Port Hole.* This is obtained by dividing the desired input by the total number of port holes.

D. *Size of Port Holes.* This is determined by consulting the "Table of Recommended Burner Inputs Per Port Hole" in Chapter 12. If this calls for a port hole size larger than No. 32 MTD drill size it will be necessary to go back to step "B" and provide for extra port holes so that the input will not be greater than 169.96 per cent per port hole. In doing this all of the things which we learned in Chapter 12 concerning burner design should be remembered.

E. *Total Area of Port Holes.* The area of various sizes of port holes will be found in the "Table of Recommended Burner Inputs per Port Hole" in Chapter 12. To get the total area of port holes, multiply the area of the port hole size determined upon by the number of port holes.

F. *Area of Smallest Cross Section of Mixing Tube.* This is determined by measuring the internal diameter of the mixing tube at its smallest point and figuring its cross section area in square inches by using the formula πR^2. Don't forget that the radius "R", is one-half of the diameter.

G. *Relation of Total Port Area to Smallest Cross Section Area of the Mixing Tube.* Take 45% of the total port area. The resulting area must be less than the internal cross section area of the mixing tube at its smallest point. Sometimes it is possible to correct an unsatisfactory condition in this relationship by changing the number and size of port holes and selecting an input per port hole between the ideal and maximum inputs.

TABLE 2. CUSTOMARY OVEN INPUTS

Cubical Contents of Oven in Feet	*B.t.u. per Hour Input per Cu. Ft.*	
	If Oven Does Not Have a Thermostat	*If Oven Has a Thermostat*
2.4 cu. ft. or less	8000	8800
Larger than 2.4 cu. ft.	10000	11000

H. *Length of Mixing Tube.* This should be at least six times the internal diameter of the mixing tube at its smallest point.

Can the Burner Be Placed in the Proper Position to Operate Satisfactorily? In every burner one must be sure that its position is such that it can obtain an ample supply of both primary and secondary air, that the products of combustion have a free chance to escape, and that there is no chance of these products getting into the primary or secondary air stream of this burner or any other burner. Where the burner delivers its heat by the method of convection its position must be such that the natural flow of burnt gases strikes the surface to be heated freely and evenly. In some instances it is necessary to use baffle plates in order to accomplish this result.

We learned in Chapter 12 that range top burners or any burners which deliver their heat by contact with the flame should be from $\frac{5}{8}$-in. to $\frac{7}{8}$-in. from the surface to be heated. The more modern ranges are for the most part so constructed that the burners for either manufactured or propane gas come within this distance range and do not require raising. Many of the older ranges, however, have burners which are from $1\frac{1}{2}$-in. to 2-in. away from the top of the

TABLE 3. CUSTOMARY COMMERCIAL AND INDUSTRIAL PROPANE BURNER INPUTS

Description of Burner	*Customary Input in B.t.u. per Hour*
Range, standard top	12000
Range, giant top	14000
Range, closed top, multiple burner type per burner	7800
Oven burners	30000-36000
Broiler burners, bar type, per bar	13000-16500
Grill burners, bar type, per bar	13000-16500
Deep fat fryers, 10 inch pot size	14400
Deep fat fryers, 14 inch pot size	32100
Sectional bake ovens, per section depending on size	36000-82000
Roasters, per section, depending on size	27000-41000
Confectioners' stoves, depending on size	35000-46000
Automatic toasters, depending on size	8000-20000
Small coffee and water urns	4465
Large coffee and water urns	11430
Small steam tables, per burner	4465
Large steam tables, per burner	11430
Bedlaster steamers (shoe factories)	6870
Pullover steamers (shoe factories)	7780
Singeing torches or "flamers" (shoe factories)	6000-7500
Pencil flame torches	10000
Common laboratory bunsen burners	5000
Small bench furnaces	7500
Steam boilers	45000 per h.p.
Radiant chicken brooders, per burner	2292

grates and therefore require raising.

There are five methods by which top burners may be raised, and I list them in the order of their desirability:

A. By installing new factory built burners with higher heads.

B. By raising the rear burner support and raising the front end by the installation of new offset gas cocks.

C. By raising the rear burner support and raising the front end by raising the manifold.

D. By raising the rear burner support and raising the front end by using offset adapters.

E. By raising the rear burner support and allowing the front end to remain "as is," thereby causing the burner to be in a slanting position.

Let us analyze these various methods and the difficulties which we are apt to encounter, as well as the respective merits.

Installing New Factory Built Burners With Higher Heads. This is by far the neatest and most satisfactory way, and, inasmuch as the burners have been designed by the factory, very little if any difficulty will be encountered. The chief disadvanage is in the cost, this being anywhere from $2 to $5 per burner.

Installing New Offset Gas Cocks. Inasmuch as all joints should be taken apart, and "re-doped," this method does not require any more work than the first one with the exception of raising the rear burner support. The raising of this support is usually a simple task, for if the rear support is in the form of a rod or bar running crosswise of the stove it can usually be raised by raising the supporting brackets in which it rests. Do not attempt to accomplish raising the bar by using an offset in it unless the bar is fastened securely at each end; otherwise, it might rotate under the weight of the burners and cause them to be pulled off from the hoods. Another method is to lengthen the supporting legs on the burner by using a small piece of strap iron bent or filed to the proper shape and bolted to the burner. If the burner is of the type that is bolted to a support at the rear it can usually be raised by using a piece of ½-in. OD copper tubing of the proper length for a spacer between the burner and the support and then using a longer bolt in the same holes, this bolt passing through the copper tubing. If no copper tubing is available, small, plain washers can be used for the same purpose.

In this connection let me emphasize one important thing. Don't be afraid of a little work with a hacksaw, file, drill and tap. Slipshod methods will never be satisfactory, and you can really do the job more quickly by doing it in the right way than you can by spending time figuring how to get out of it the easiest way.

Raising the Manifold. This method may present difficulties from three angles.

A. It may be necessary to change the manifold supports.

B. The manifold may be connected to an oven burner pipe which may require lengthening.

C. It may be necessary to drill new holes in an enameled valve panel.

The changing of the manifold supports is usually not such a difficult task, but if they are of cast iron it may require quite a lot of filing or grinding. Oftentimes it is much easier to entirely discard the old supports and make new ones out of strap iron.

The lengthening of the oven burner pipe is best accomplished by using a new piece of pipe of the correct length. A quick method is to discard the old pipe entirely and use ½-in. OD copper tubing with the proper fittings.

The drilling of new holes in an enamelled panel is a ticklish task, for enamel in its characteristics is much the same as glass. If you attempt to do this by ordinary drilling methods you are asking for trouble. The best method that I have found is to use a set of very sharp dividers. Set these at least ⅛-in. larger than the hole that you wish to drill. Keep rotating the dividers until you have cut completely through the enameled surface right down to the bare metal. Don't use too much pressure. After having cut through the enamel, drill through the metal with a regular metal cutting drill, but don't try to cut too fast, and allow the metal to cool after you have taken three or four turns, otherwise the heat of drilling may cause the enamel to crack.

A conversion made in this manner is apt to be objectionable to the customer because of the second set of holes. Sometimes the valve handles will cover these holes up. These holes may be made less objectionable by the use of grommets and fillister head machine screws, or if these are not obtainable use common flat headed stove bolts.

Raising the Front End of Burner By Use of Offset Adapters. This is perhaps the easiest method and the most commonly used. Its chief disadvantage is that it throws the burners out of alignment with the rest of the range—particularly the top grates. In this respect impingement upon the grates should be avoided if at all possible.

Raising the Rear Burner Support Only. This is a sloppy and inefficient method, and should be avoided if at all possible. Such a conversion is apt to do you more harm than good.

Will the Conversion be Economical and Satisfactory? If the range is in good condition, properly insulated, equipped with heat control, and the conversion is properly made there is no reason why it should not be practically as efficient and satisfactory as a range built at the factory for propane gas. Such work, however, should not be done without charge, and a fair average of costs for making a proper conversion will run somewhat as follows:

Conversion and drilling of each top burner, per burner.....$1.

Conversion and drilling of each oven or broiler burner.....$1.

Readjusting of thermostat by-pass and pilot adjustments.....$1.

New burners or valves are not included in the above.

It will be noted from this that the cost of converting a range by the offset adapter method would be approximately $6 if the oven and broiler burner is one, as in many

ranges. A profit should be figured on top of this. I make mention of these costs for the reason that excellent propane ranges are available upon the market at very small cost, and if this matter is brought to the customer's attention it may in some cases result in the sale of a new appliance.

Uninsulated ranges or those without thermostats should never be sold for use with propane. If the conversion is of this type it would be better for you to forget about it, or if you are one of those operators who makes a practice of making conversions for your customers without cost, you would be about as well off to buy a new range for him and make him a gift of it. What you lost in dollars and cents by doing this you would make up in customer satisfaction.

Making the Actual Conversion. If you have decided that it is desirable to make the conversion the first step is to completely disassemble all of the gas piping. This is necessary because ranges for use on manufactured gases are often put together with pipe joint compounds that are soluble in any of the liquefied petroleum gases. There are several good pipe "dopes" on the market which are suitable for propane. I suggest that you follow the recommendation of your propane supplier in this respect. Apply joint compound sparingly, and to the male threads only, being careful that none carries over onto the edges to later give you trouble in fouling thermostats or plugging orifices.

After having assembled the piping back into the position that you want it, remove the hoods from the end of the valves. Beneath these hoods you will find a pointed projection, its function being to provide adjustment of flow when the range is used in connection with manufactured gases. This pointed projection must be removed. In some cases it is a separate piece and can be removed with pliers. In other instances it is cast as an integral part of the valve body and must be sawed off. Cast brass projections can be broken off easily by twisting or bending them with a heavy pair of pliers.

The next step is to install hoods with the proper size of orifice for each burner. There are three methods by which this may be accomplished. The first method is to install new hoods with the orifice drilled directly in the hood. The second method is to tap a spud into the present hood with the correct orifice drilled in the spud. The third method is to install Anderson-Forrester adapter spuds. This last method requires some special tools which you can obtain from the manufacturer. If offset adapters are used they are screwed onto the valve body in place of the hood.

Don't Solder Old Hole

I must mention one problem which you may have to face, and how you can meet it. Perhaps you may be caught out in the field without any new hoods or spuds, and are forced to make a conversion. I have known service men to meet the situation by soldering up the old hole and drilling a new one in the

solder. This is bad, and should never be done. I have known the solder to be melted off from the soldered hood, and the results have been serious. A better way to meet the situation is as follows: Carry a few 6-32 brass machine screws with you, and a 6-32 tap. Tap out the old orifice hole with the 6-32 tap, but do not run the tap way in beyond the taper. Then screw the 6-32 machine screw into the tapped hole so that its end projects slightly into the interior of the hood. Saw the screw off 1/16-in. above the face of the hood. Place a nail set or small pin punch against the protruding inner end of the cut off screw and pien it tightly into position from the outside. Then prick punch the center of this stud and drill the orifice hole in it.

If you do not happen to have a 6-32 machine screw or tap with you you can always find an old brass screw around the premises. Drill the hood orifice out so that a plug from the screw will fit tightly into it. Pien this plug tightly into place and drill the new orifice hole in it. This method is a little more difficult than the tapping method, in that it is harder to hold the plug in the exact position that you want it for heading on each side, but if a little care is used, equally satisfactory results can be obtained. Here is another word of caution—do not use anything but brass for a spud or plug in the hood, because you want a metal of approximately the same expansive qualities as those of the brass hood, and the use of any other material might result in a loose plug under conditions of extreme heat.

At this point I am going to make a statement which may be questioned by some operators. It has to do with the drilling of orifices. Often the question is asked, "Which should be used for drilling port holes, reamers or MTD drills?" My answer is "MTD drills, of course." Both reamers and drills are complementary. Neither one can properly fulfill the functions of the other. *Drill* all orifice holes. If you wish an input in between the MTD drill sizes, *ream* the hole slightly with reamers. I believe that this is the only method by which any degree of accuracy may be attained.

Drill Evenly All Holes

The next operation is to drill the port holes in the burners to the proper size as well as drill any additional port holes that you have decided are necessary. This can be done with a hand drill, but it is an arduous task if many holes are to be drilled. Cheap, *slow speed* 1/4-in. electric drills are available for as little as $9.75 and they are admirably suited for this purpose. Of course the best method is to take the burners to a drill press, but this is not always possible when you are out in the field. Try to drill all holes evenly and at the same angle. Never use any oil or cutting compound when drilling or threading cast iron, brass, zinc, copper, lead, or white metal. If you do, the fine chips will clog the cutting tool flutes and damage it.

Having drilled the burners you are now ready to put them in position and proceed with the adjustment of the burners and thermo-

TABLE 4. DIMENSIONS OF STANDARD WELDED STEEL PIPE.

Size, in.	Diameters, in.		Nominal thickness, in.	Circumference, in.		Transverse areas, sq in.			Length of pipe in feet per sq ft of		Length of pipe containing 1 cu ft, ft	Nominal weight per ft		Number of threads per in. of screw	Distance pipe enters	Drill for tap
	External	Approximate internal		External	Internal	External	Internal	Metal	External surface	Internal surface		Plain ends	Threaded and coupled			
⅛	0.405	0.269	0.068	1.272	0.845	0.129	0.057	0.072	9.431	14.199	2533.775	0.244	0.245	27	¼	2 21/64
¼	0.540	0.364	0.088	1.696	1.144	0.229	0.104	0.125	7.073	10.493	1383.789	0.424	0.425	18	5/16	2 29/64
⅜	0.675	0.493	0.091	2.121	1.549	0.358	0.191	0.167	5.658	7.747	754.360	0.567	0.568	18	5/16	2 19/32
½	0.840	0.622	0.109	2.639	1.954	0.554	0.304	0.250	4.547	6.141	473.906	0.850	0.852	14	3/8	2 23/32
¾	1.050	0.824	0.113	3.299	2.589	0.866	0.533	0.333	3.637	4.635	270.034	1.130	1.134	14	7/16	1 15/16
1	1.315	1.049	0.133	4.131	3.296	1.358	0.864	0.494	2.904	3.641	166.618	1.678	1.684	11½	9/16	1 3/4
1¼	1.660	1.380	0.140	5.215	4.335	2.164	1.495	0.669	2.301	2.767	96.275	2.272	2.281	11½	5/8	1 13/32
1½	1.900	1.610	0.145	5.969	5.058	2.835	2.036	0.799	2.010	2.372	70.733	2.717	2.731	11½	5/8	1 23/32
2	2.375	2.067	0.154	7.461	6.494	4.430	3.355	1.075	1.608	1.847	42.913	3.652	3.678	11½	11/16	2 3/16
2½	2.875	2.469	0.203	9.032	7.757	6.492	4.788	1.704	1.328	1.547	30.077	5.793	5.819	8	13/16	2 11/16
3	3.500	3.068	0.216	10.996	9.638	9.621	7.393	2.228	1.091	1.245	19.479	7.575	7.616	8	1	3 5/16
3½	4.000	3.548	0.226	12.566	11.146	12.566	9.886	2.680	0.954	1.076	14.565	9.109	9.202	8	1 1/16	3 13/16
4	4.500	4.026	0.237	14.137	12.648	15.904	12.730	3.174	0.848	0.948	11.312	10.790	10.889	8	1 1/16	
4½	5.000	4.506	0.247	15.708	14.156	19.635	15.947	3.688	0.763	0.847	9.030	12.538	12.642	8	1 1/16	
5	5.563	5.047	0.258	17.477	15.856	24.306	20.006	4.300	0.686	0.756	7.198	14.617	14.810	8	1 1/16	Taper of thread ¾ in. per ft, 3/16 in. per in., or 3½°
6	6.625	6.065	0.280	20.813	19.054	34.472	28.891	5.581	0.576	0.629	4.984	18.974	19.185	8	1 1/4	
7	7.625	7.023	0.301	23.955	22.063	45.664	38.738	6.926	0.500	0.543	3.717	23.544	23.769	8	1 1/4	
8	8.625	8.071	0.277	27.096	25.356	58.426	51.161	7.265	0.442	0.473	2.815	24.696	25.000	8	1 5/16	
8	8.625	7.981	0.322	27.096	25.073	58.426	50.027	8.399	0.442	0.478	2.878	28.554	28.809	8	1 5/16	
9	9.625	8.941	0.342	30.238	28.089	72.760	62.786	9.974	0.396	0.427	2.294	33.907	34.188	8	1 3/8	
10	10.750	10.192	0.279	33.772	32.019	90.763	81.585	9.178	0.355	0.374	1.765	31.201	32.000	8	1 1/2	
10	10.750	10.136	0.307	33.772	31.843	90.763	80.691	10.072	0.355	0.376	1.785	34.240	35.000	8	1 1/2	
10	10.750	10.020	0.365	33.772	31.479	90.763	78.855	11.908	0.355	0.381	1.826	40.483	41.132	8	1 1/2	
10	10.750	10.020	0.365	33.772	31.479	90.763	78.855	11.908	0.325	0.347	1.515	45.557	46.247	8	1 5/16	
11	11.750	11.000	0.375	36.914	34.558	108.434	95.033	13.401	0.299	0.315	1.254	43.773	45.000	8	1 5/8	
12	12.750	12.090	0.330	40.055	37.982	127.676	114.800	12.876	0.299	0.318	1.273	49.562	50.706	8	1 5/8	
12	12.750	12.000	0.375	40.055	37.699	127.676	113.097	14.579								

stat as you were instructed in Chapters 9 and 10.

Building Bar Burners. The same general rules as to dimensions, inputs, etc., apply when bar burners are constructed for any special purpose. Bar burners can be made out of black or galvanized steel pipe, but the black pipe is preferable. Caution: In laying out the port holes look over the pipe carefully and make sure you won't have to drill the holes through the welded seam, for this is tough drilling. Mixing chambers can be bought from any one of several manufacturers. Personally, I prefer the type of mixing chamber which is threaded onto the pipe, and into which the shut-off valve with the spud is also threaded, for this makes possible the holding of all units firmly in perfect alignment. Table 4, showing welded steel pipe sizes and dimensions will be helpful to you in figuring the sizes and capacities of burners which you wish to build. Use extra heavy pipe if it is obtainable, for in this way you can procure a greater depth of port hole.

Study is Only Elementary

We haven't learned tonight all that is to be known about conversions and building special burners. Our study of atmospheric burners has been elementary and fundamental. Someday, when you and I have mastered simple appliance burners we will have a lot of fun with high pressure and pre-mix burners such as are used on many industrial jobs. Let's end this session by asking a few questions—and then checking ourselves by reading the correct answers on Page 68.

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Questions on Chapter 13

1. What four questions should be asked before one attempts to convert a burner?
2. What should the input per hour be for a burner to heat 12 quarts of water from 60° to 212°F. in 10 minutes, the efficiency of the burner being 55%?
3. What size of orifice would you use for this burner?
4. A broiler compartment measures 22 in. x 24 in. What should the burner input be?
5. An oven, equipped with heat control measures 22 in. x 24 in. x 18 in. What should the burner input be?
6. What are the four methods of raising range top burners?
7. Why should the piping in every conversion job be taken completely apart?
8. How would you obtain an orifice hole in between a No. 54 and a No. 55 MTD size.
9. What is the maximum number of No. 32 MTD port holes that a 1 in. standard welded pipe burner should have?
10. What should be the minimum length of the mixing tube for a burner constructed out of 1 in. standard welded pipe?

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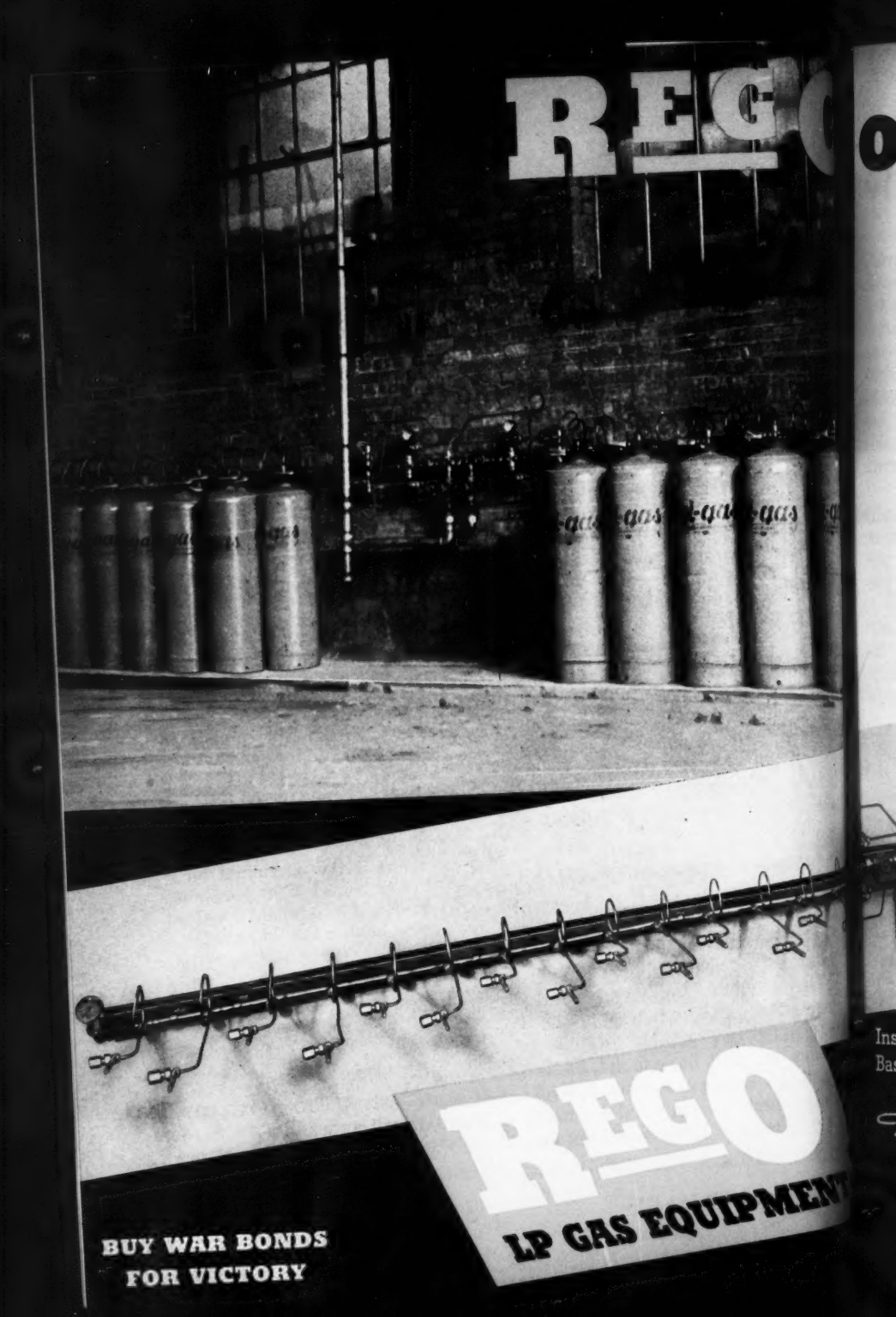
(Chapter 14 of THE BOTTLED GAS MANUAL *will appear in the September issue, of* BUTANE-PROPANE *News.)*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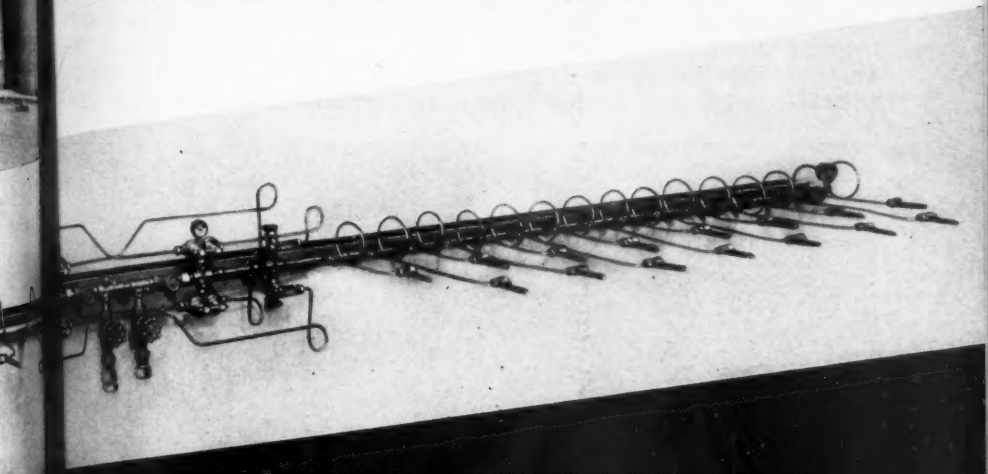

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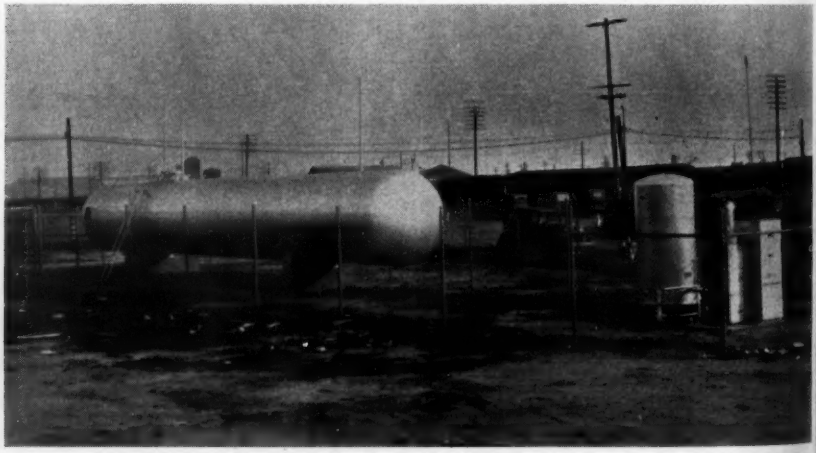
Standbys Underwrite Gas Supply

IN THE past year many LP-Gas standby units have been rushed to completion in manufacturing plants throughout the nation. Behind this rapid building was the threatened shortage of natural gas due to unusually large demands caused by the war. The acceptance of butane and propane for standby facilities has been a boon to the LP-Gas industry as well as a service to the nation in the furtherance of national defense.

Typical of the many installations made during the past year is the butane standby system built at the Los Angeles plant of the Continental Can Co. Here, as in hundreds of other plants, the threat of a possible gas shut-off during hours of peak gas loads in winter months, caused the management to decide on the installation of a standby system. After careful consideration of all standby equipment, it was realized that butane could be adapted to the company's needs more readily than other fuels, at less expense and with a reasonable guarantee that constant service would be maintained.

Engineering and construction work was performed by the American Liquid Gas Corp., of Los Angeles. It is one of 14 similar systems installed by this company in the Southern California area during the past year. Although the plants are alike in most respects, the concerns for which they have



LP-Gas standby plant of the Continental Can Co. in Los Angeles. Typical of many such plants, the unit is ready to supply butane-air to the factory at a minute's notice.

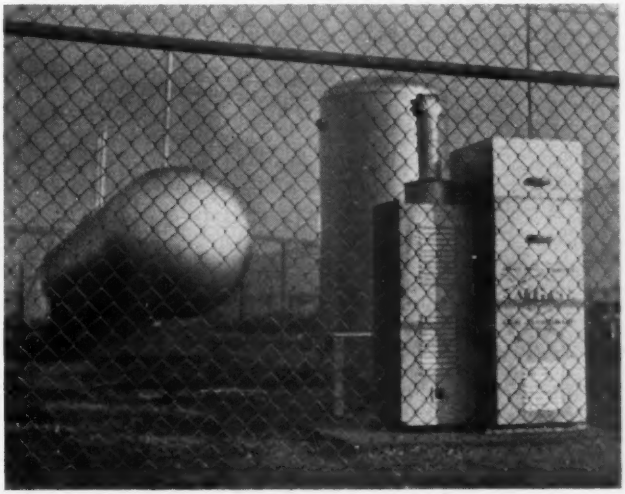
been built include a wide cross-section of industry. A few of the organizations served include; Willard Storage Battery, Interstate Baking Co., General Cable Corp., Southwestern Pipe Co., Douglas Aircraft Co. and several United States army camps.

In laying out the plant for the Continental Can Co., engineers had to consider the factory's connected natural gas load of approximately 6000 cu. ft. of 1100 B.t.u. gas per hour. Owing to the difference in the specific gravity of the natural gas and the butane-air gas, a carefully worked out formula, with proper proportioning, was developed by engineers. The standby gas thus supplied is scientifically correct as a replacement fuel.

The load varies throughout the day and the equipment used must be capable of supplying gas at a constant pressure and B.t.u. value. This is very important as the pressures used in the plant range from four ounces to several pounds, and must be constant in order to avoid trouble on certain types of burner equipment.

In this plant, as in many others, the butane-air is utilized in existing mains and appliances without any changes or adjustments being made to them. This ease with which fuel change-overs can be made, without large expenditures for additional utilization and controlling equipment, is an important contributing factor in the acceptance of LP-Gas standby systems.

Liquid storage facilities for the plant consist of a 10,000-gal. butane tank, having a working pressure of 137 lbs. per sq. in. Mounted horizontally, the storage tank, along with the compact vaporizing equipment, is enclosed by a heavy wire fence. Apparatus used in this plant for the vaporizing and air-



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The 10,000-gal. storage tank and vaporizing equipment is tightly enclosed by a heavy wire fence with locked gate.

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mixing of the butane from liquid to gas was manufactured by the Gasair Corp. of San Francisco.

When the liquid has passed through the vaporizing equipment and emerges as a gas-air mixture, at five lbs. pressure, it passes through a pipe leading to the plant's main distribution system. It is connected at a point below the natural gas meter. Here an additional pressure control regulator and a shutoff valve have been installed and it is here that the actual changeover from natural gas to standby is made.

The changeover process consists of opening the standby shutoff valve and closing the natural gas shutoff valve. The process is so simple that it can be done by one man in 30 seconds. This simplicity has been an important factor in the rapid growth of LP-Gas standby plants, especially where uninterrupted service is vital.

The LP-Gas standby guarantees a constant, ready supply of gas throughout the "standby" season. This season may vary considerably according to locality, but as long as liquid is available and the plant is set for operation, the changeover can always be made within a very short time.

The use of LP-Gas for standby facilities has increased rapidly during the past two years. During time of war the importance of LP-Gas to the maintenance of industrial production is clearly seen. Its economy, ease of handling, cleanliness and adaptability to equipment and appliances already in use make LP-Gas an ideal fuel for standby use.

Large increases in domestic and industrial consumers before industry expansion was curtailed has compelled Mike Trammell to add another 4002-gal. delivery transport to his butane equipment in Sweetwater, Texas. For better service from his two 4000-gal. storage tanks he has also installed an electric pump to avoid delay in loading and unloading and for fuel service to cars and trucks. All storage, fuel and truck tanks were made by the Wendland Manufacturing Co., of San Angelo, Texas.

LP-Gas Production Problems

WAYS and means of greatly increasing the extraction of liquefied petroleum gases with the existing equipment of present natural gasoline plants was the subject discussed by J. W. Wilson, Cities Service Oil Co., at the 21st annual convention of the Natural Gasoline Association of America, held in Tulsa, Okla., May 14-15.

J. W. WILSON

To provide for the expanding use of LP-Gases, particularly for the manufacture of 100 octane gasoline and synthetic rubber, the Office of Petroleum Coordinator for National Defense earlier this year issued recommendations to the natural gasoline industry to increase the percentage of butane and isobutane extracted from the gas processed at such plants and in liquid form to the maximum quantities economically possible.

Mr. Wilson stated it has been estimated that approximately 800,000,000 gals. per year of butylene and 1,000,000 gals. per year of isobutane will be required in the 100 octane gasoline production. For the production of 700,000 tons per year of Buna-S rubber will require 700,000,000 gals. per year of butane, or a total of 2,500,000,000 gals. per year. The total sales of LP-Gases in 1941 amounted to 445,000,000 gals. The amount produced and used in 100 octane gasoline or blended into motor fuel is not known but is greatly in excess of the products recovered and sold as LP-Gases.

Of the total required, approximately one-half will be obtained from refinery gases and the balance from natural gasoline, recycling and repressuring plants.

After Mr. Wilson completed his technical descriptions of ways whereby increased production can be obtained with present equipment, he closed with the following remarks:

"How far can the natural gasoline operator go in adding investments, increasing his operating costs, possibly rerouting his processing steps, all to squeeze the last gallon of the butanes from his gas? The economic limits will vary with the individual plant, and there is considerable difference in opinion as to just what these limits are. Unless the operator has some definite idea of prices in advance, he cannot make a reliable estimate of the expenditures he can justify. As a liquefied petroleum gas fuel, butane has not been too attractive to some operators, due to various reasons, including the difficulties in handling, storage, transportation and price. As a raw material, essential in a chemical process to produce rubber, butane acquires new status.

"When we debutanize normal blend-

ing grades of natural gasoline to obtain additional butane for chemical synthesis, the new base line is at least the value of natural gasoline. Starting with such a base line, the smaller operator can view his butanes as a liquid in a better light than when his only outlet for these components is a competitive fuel market.

"We have many short cuts to butadiene production. Of these shorter methods, the use of butane as the starting agent is certainly the shortest from the standpoint of speeding up the development and production of Buna-S rubber. For this reason, as well as the huge volumes needed for 100 octane gasoline, and other war requirements, it is inconceivable that the use of butane for these purposes will be necessarily restricted because the economics of inequitable returns to the manufacturers of the butanes prevent their concentrating serious attention on the problem of effecting full butane recovery in liquid form. It is conceivable, however, that as the rubber program gathers momentum, it may become imperative that we recover all of the butanes as a liquid from the gas processed, or at least within the limits of the equipment available.

"Our prompt attention to what will ultimately be necessary in new plant equipment, utilization of existing idle equipment, or change-over of equipment now operating, together with possibly better operating procedures, even though more costly, will without delay enable us to determine what we will need in economical return to operate under maximum recovery conditions."

This novel home is called "The Show Boat" and is located at Lake Louise Groves, Clermont, Fla. It is owned by Capt. E. K. Brockway and has been completely equipped by Green's Fuel, Inc., Sarasota, Fla., with liquefied petroleum gas. It has a winter air conditioning furnace thermostatically controlled, with ducts to all rooms.

Dallas Tank & Welding Co. Plans New Building

Dallas Tank & Welding Co., is surveying a plot of ground consisting of 3½ acres north, and adjoining its present property, which has just been purchased preparatory to putting up a new building to facilitate construction work in connection with government orders on file.

The company hopes to get underway with the building within the next 30 days, according to W. W. Banks, president. The dimensions of the new building will be 93 ft. x 180 ft. It will be equipped with two cranes.

◆ ◆

B. T. Harris Entertains Employes and Friends

One hundred forty pounds of prime beef, raised on the 640 acre river bottom farm of B. T. Harris on the Fouche River, 70 miles from Little Rock, Ark., were consumed by 78 guests who attended the picnic of the Butane Gas Co., Inc., of Little Rock, May 17. (See photo of group below.)

On the morning of the picnic, Mr. Harris arose at 2 o'clock to prepare the young beef for barbecue.

In addition to Mr. Harris' own farm, he has under fence 11,000 acres of national forest land which he has leased, wherein he maintains about 250 head of Hereford cattle.

Among the prominent guests who attended the barbecue were F. A. Henninger, McNamar Boiler and Tank Co. of Tulsa, Okla., and wife, and Mr. and Mrs. J. D. Newcomb, Jr. Mr. Newcomb is state boiler inspector of Arkansas.

◆ ◆

Kerotest Has New Extension At Its Pittsburgh Plant

Kerotest Manufacturing Co., makers of brass and steel valves, has completed a three-story brick, steel and concrete extension of its present plant at Liberty Ave. and 26 St., Pittsburgh, for a factory with office space, and has cleared ground for another one and a two-story building in the next block.

Total cost of the new improvements, including machinery and tools, is estimated at $1,250,000.

The May picnic of the Butane Gas Co., Inc., of Little Rock, Ark., was held at the Fouche river farm of B. T. Harris.

BANKS TANKS DOMINATE

DALLAS TANK EXPANDS AGAIN!

By W. W. BANKS

We take great pleasure in announcing that it has become necessary to expand our facilities again, for the fourth time, since we first started manufacturing Economy Butane Systems and tanks.

In the beginning we anticipated a large volume of business and built our plant amply large, as we thought, to fulfill all future requirements. But the volume during these years has made it absolutely necessary to increase our plant capacity FOUR TIMES!

A three and one-half acre plot adjoining our present plant on the North has been purchased and within the next 30-days construction of a new building will be started. The new building, entirely modern in facilities, will be 180 feet by 93 feet and equipped with two cranes.

The difficulties of securing equipment for construction work with war-time conditions have been surmounted by our greater desire to render the best service to our country and to our customers. We have finally located what we wanted for this building in Marietta, Ga. An existing building has been purchased, dismantled, and shipped to Dallas to occupy the new site.

We want you to know that we appreciate the business you have given us. This, and the government orders now on file, have made necessary these expansions.

● *Our Engineering department will be glad to assist our dealers with technical information.*

● *We are glad to assist our dealers with the latest available information on governmental regulations.*

DALLAS TANK AND WELDING COMPANY, INC.

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RESEARCH

• **EACH MONTH a competent staff reviews more than 70 publications serving the oil, gas and affiliated industries in a search for those published articles of value to technicians and executives in the liquefied petroleum gas industry. In this department of BUTANE-PROPANE *News*, brief abstracts of such articles are presented.—Editor.**

Chemical Dictionary—Compiled by F. H. Campbell, D.Sc., F.A.C.I. An 85-page dictionary of most commonly used chemical terms that is compact enough so it can always be kept close at hand for ready reference. The nearly 1000 terms included have been selected as those which will best serve the needs of chemists who do not have available the more exhaustive chemical dictionaries. It is valuable to students as well as chemists, chemical engineers and technicians, especially for its valency table. Published 1942 by Chemical Publishing Co., Inc., Brooklyn, N.Y. Price $2.50.

Flow of Water Through Pipes—R. W. Machen. *Oil and Gas Journal*, April 9, 1942, pp. 39, 40. Practically all the formulas on the flow of fluids through pipes are based on the flow formulas for water. In this article the author discusses the fundamental equations dealing with this problem. In many cases these equations can be applied directly to problems in operation of lease, gasoline plant, refinery, and pipe-line systems. For other work, more advanced forms must be used.

Conditioning Raw Natural Gasoline in the Field. *Refiner*, April, 1942, pp. 112-114. Conditioning raw natural gasoline in the field so the propane-butane fractions of several plants can be sent to one point for fractionation and recovery of isobutane is a marked trend in plant operation. The increased demand for butane in the manufacture of 100-octane aviation gasoline and the prospect for further demand for these hydrocarbons in the making of synthetic rubber indicate that gasoline-plant design will follow the pattern that will allow for full recovery of hydrocarbons, which until recently were by-products, chiefly used as liquefied petroleum gas. Details of the fractionation scheme in this article represent what has been done by one company in order to provide a source of isobutane. Because of military requirements the name of the company and the location of the plant are not given. The flow diagram is given in sufficient detail to simulate actual installations.

Fuel Economy in Refineries—D. O. Lawrence. *California Oil World*. 1st April issue, 1942, pp. 13, etc. Because fuel costs represent from 20 to 30% of total direct operating costs in an oil refinery, it is a very attractive field to attack in an effort to reduce operating expenses. Fuel is used to generate utilities and for process work. Fuel consumption is divided about equally between utility generation and process work. Fuel costs for utilities can be kept to a minimum by efficient generation and usage. Inasmuch as generating facilities and the necessary operating personnel are centralized and operation is routine, the efficient generation of utilities should not present any particular problem. Usage of utilities is a quite different problem. Products from the various processes change with consumer demand, seasons, etc., which vary the utility requirement, changing loadings on utility systems, individual drives, etc. To maintain a high efficiency in usage, constant modification and changes are required. Fuel con-

sumed by the processes may be reduced by efficient heater design, by heat exchange from hot streams to incoming charge, to reboilers, to steam generators, to boiler feed water, etc. In other words, all available heat should be used, if economically possible, for some useful purpose rather than absorbed by the plant water supply. An A.P.I. paper.

Physical Constants of Low Boiling Point Hydrocarbons and Miscellaneous Compounds—R. Matteson and W. S. Hanna. *California Oil World*, 1st April issue, 1942, pp. 5, etc. During the past 10 years a number of useful compilations of physical constants, ranging from the California Natural Gasoline Association's concise tabulation to the exhaustive volumes by Egloff, have been published. None of these, however, serves as a compact table suitable for notebook use by the engineer or research technologist in the petroleum and allied industries. To fill this need a table of the physical constants of a number of hydrocarbons, principally in the gasoline boiling range, and certain miscellaneous compounds of interest in the petroleum and natural gas industries has been prepared. The tabulation of constants is given as Table 1, and the bibliography of references from which the basic constants were derived is contained in Table 2. A C.N.G.A. paper.

Critical States of Two-Component Paraffin Hydrocarbon Systems—by F. D. Mayfield.

Heating, Ventilating and Air Conditioning Guide, 20th Edition, 1942. Published by American Society of Heating and Ventilating Engineers.

S.A.E. Handbook, 1942 Edition. The S.A.E. Handbook is the official publication of the Society of Automotive Engineers that contains the current SAE Standards and Recommended Practices of the Society, except those specifically for aeronautical use.

Vapor-Liquid Equilibria for Hydrocarbons—C. D. Shiah. *Refiner*, May, 1942, pp. 132-134. It was found that if the reciprocals of temperatures at which two substances exert equal vapor - liquid equilibrium constants are plotted against one another, the points so obtained would form a straight line. Based on this fact, a chart is prepared to represent vapor-liquid equilibrium constants for all hydrocarbons at all temperatures and pressures. For compactness and ease of application this chart excels over other forms of presentation. This chart is also useful for the prediction of vapor-liquid equilibria of high-boiling hydrocarbon fractions.

Code for Pressure Piping—G. K. Saurwein and A. B. Stickney. *Heating, Piping and Air Conditioning*, April, 1942, pp. 215-219. Article No. 4. The code sections of district heating piping, and on refrigeration piping (including air conditioning) are reviewed by the respective subcommittee chairmen.

Making the Refinery Weld—W. L. Archer. *Refiner*, April, 1942, pp. 119-121. A discussion of the various types of welds that have application in the refining industry. These welds are illustrated.

Fundamentals of Refinery Piping Design — Dr. A. Cibulka. *Refiner*, April, 1942, pp. 123, 124. Part 4. Flow and miscellany.

Papers presented before the Petroleum Division of the American Chemical Society, Memphis, Tenn., April 20-24, 1942. The titles and authors of the various papers follow:

Substitute Fuels, a War Economy of World Dimension—by Gustav Egloff and P. M. Van Arsdell.

Determination of Olefins in C_3 and C_4 Hydrocarbons—by B. R. Stanerson and H. Levin.

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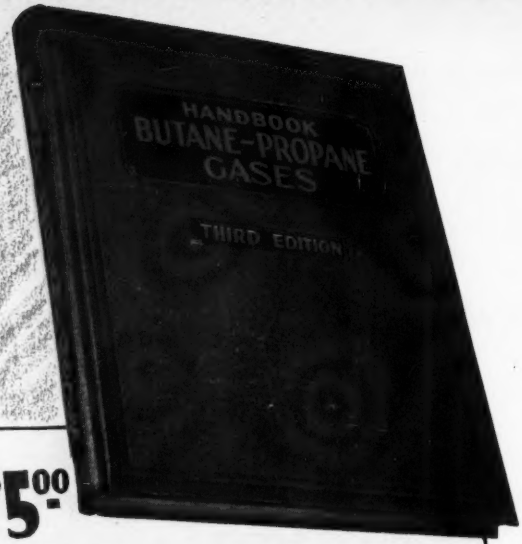

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Designed for ready-reference use by both the experienced operator and the newcomer to the industry, it is the source to which you will be referred if you address an inquiry about Butane or Propane gases to the U. S. Bureau of Mines. It is the standard textbook on LP-Gas used by engineering schools in most universities and colleges.

Arthur Rohman, who assisted in the editing of the Revised Second Edition, is editor-in-chief. He is also editor of BUTANE-PROPANE News, and managing editor of G A S, The Natural Gas Magazine.

Justus Krappe, technical editor, was formerly director of Gas Engineering Research at Purdue University and previously with the American Gas Association.

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ference Book On
perating Methods

LP- Gas Counter Appliances Build Domestic Load

By E. CARL SORBY*
Promotion Director, Geo. D. Roper Corp., Rockford, Ill.

IF you should live to be 70 years old it is estimated that you will eat 1400 times your body weight, or more than 100 tons of food. Your diet will include approximately 6000 loaves of bread, 3 oxen, about 300 chickens, 2000 large fish, 9000 pounds of potatoes, 12,000 quarts of coffee, 1000 pounds of salt, 8000 pounds of sugar—and you will spend about 41,400 hours, or 5 full years, just stuffing it into your mouth.

E. CARL SORBY

Is it any wonder, therefore, that we as an industry should pay serious attention to how this food is cooked for human consumption?

Granted that the bulk of this food will be prepared in homes and that most of the homes will cook this food with gas, the fact still remains that there are millions of people who part company with their home fires to "eat out." Millions of these people "eat out" through choice, others because of necessity. Millions of others "eat out" for the sheer joy of eating out. To another large percentage of "eating-outers" it is an event, a new experience, a thrill of a lifetime. Millions of miles are driven annually by untold millions of people in order that their palates may be pleased with food that is rich and savory in flavor, properly served in an atmosphere that is pleasing. Weather, roads, distances, traffic and cost have no bearing on their decision to eat out.

Therefore, as I see it, anything you can do as gas men to modernize restaurant equipment with new gas counter appliances is that much more strength added to your *main line of defense.*

A "traveling, eating public" views the modernity of an eating establishment by its equipment. Likewise, they measure the value of the food they eat by the method used in its preparation. If their impression of modernity is reflected in what they see over the counter and if the food they eat is cooked with gas, then in all probability they will think that *gas* is the best fuel with which to cook food.

If a customer views a battery of electric appliances on the back bar of an eating establishment, add to what they know and hear and read about insofar as electric co-

* The substance of a talk given before the Southern Gas Association.

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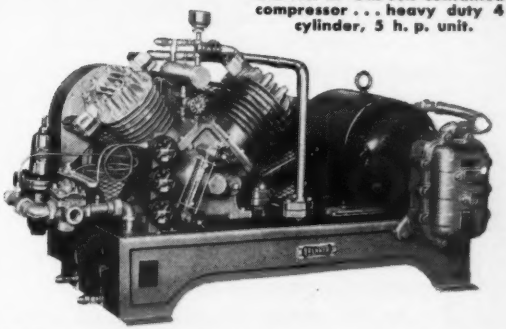
Because LP-Gas is a housing necessity in many defense areas, handling equipment that will be made available must be dependable. Brunner LP-Gas self-contained compressor units are a self-liquidating investment that pay for themselves from savings in gas recovered from tank cars unloaded. Brunner units conserve man-power by reducing the time required to unload tank cars. Safe, efficient and economical, Brunner is the answer to liquid petroleum gas handling problems. Brunner Manufacturing Co., Utica, N. Y., U. S. A.



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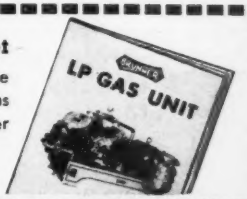

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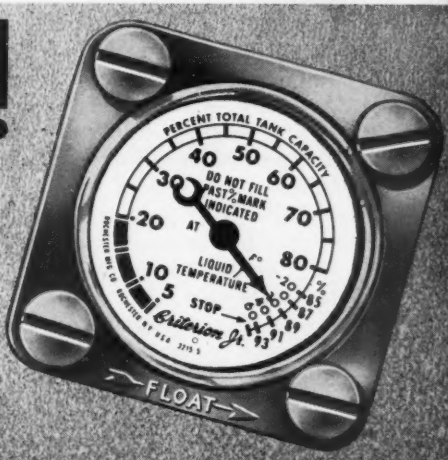

Rochester Mfg. Co., Inc., 17 Rockwood St., Rochester, N. Y.

ROCHESTER *Criterion* GAUGES

ing is concerned, then their interpretation of modernity is electricity.

You, therefore, have a real responsibility in utilizing the attractive counter gas appliances that are made available to you by various manufacturers in our industry to maintain a good impression.

Efforts of the manufacturers to streamline counter appliances will certainly be stymied if the indifference of the industry to the further sale and installation of counter appliances continues.

As the result of this kind of effort on your part, manufacturers can be stimulated to continually improve their equipment and to bring about and promote the standardization of appliances from a design point, such as style, finishes, base dimensions and actual dimensions of the appliance involved.

Service to your customers is all important. As the modern gas range interprets the modernity of gas—the wonder fuel—then certainly modern counter gas appliances can share that same responsibility.

Millions of dollars are spent annually by owners of eating establishments to improve their fronts to attract the "eating public," and unless you assume the responsibility in your own community to improve the service behind the front, the impression of that particular eating establishment will be only a one-shot deal. People do not go back to eat in places they do not like and by the same token these same people will go out of their way by many miles to eat in places they enjoy. The acceptance of counter gas appliances and constant interest in them commercially can only be created and kept alive so long as you, the gas man, will develop sufficient interest by way of advertising and display to inform local establishments of their availability and improvement.

◆ ◆

Laboratories Engineers In the Armed Forces

Bringing the number of former Laboratories engineers now serving in the armed forces to a total of 18, Carl F. Geltz and Norman F. Schulz were recently inducted.

Mr. Geltz, who for the past several months has been acting as assistant chief inspector at the Cleveland Laboratories, resigned on May 12. He has become well known to manufacturers of gas equipment as a result of visits to their factories.

Mr. Schulz joined the Laboratories in March, 1941. He was mainly engaged in the research repartment where he assisted in industrial research on reducing atmospheres.

In the navy, two former Laboratories engineers were recently promoted to the rank of ensign. Walter J. Gay enlisted the first of this year and was stationed at Annapolis where he successfully completed the V-7 course given to graduate engineers to qualify for his new rank. He is now at Edgewood Arsenal.

Frank J. Pryatel was commissioned after six months of preliminary training in naval ordnance in Philadelphia where he was primarily engaged in adjustment and repair of special instruments and apparatus. During the course of this brief assignment, he was recipient of the coveted Navy "E" for meritorious industrial achievement.

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Blodgett Oven users are usually so well satisfied that it's sometimes difficult to sell replacements. But even Blodgetts wear out eventually. And remember—when you replace a wasteful, worn-out oven with a new Blodgett, you are doing a definite service.

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DIAMETERS UP THROUGH 60"
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YOUNGSTOWN, OHIO.

Shell Oil Executive Will Aid War Effort

Shell Oil Co., Inc., announced July 13 that L. T. Kittinger, vice president in charge of marketing for the territory east of the Rocky Mountains, has been granted a leave of absence to head the Salvage Section of the Materials Division of the War Production Board. Mr. Kittinger has assumed his duties in Washington.

Simultaneously, Alexander Fraser, president of Shell, announced the appointment of P. E. Lakin, resident vice president in Shell's Chicago office, as Mr. Kittinger's successor. Mr. Lakin is moving to New York immediately, where he will direct all of the company's marketing activities in the territory east of the Rockies.

For the past several months Mr. Kittinger has been assisting in the organization, among the oil, automobile and rubber industries, of a nation-wide field force of over one million employes and dealers to take an active part in, or form the nucleus of, salvage committees on a community-wide basis all over America. This huge field organization, the formation of which began under Mr. Kittinger's direction within two months after the country declared war, plus their 400,000 business establishments, will be an important contribution in the new Salvage for Victory Program launched by the Bureau of Industrial Conservation on a nation-wide basis July 20.

◆ ◆

C. B. Beaulieu Goes "Over-Seas"

C. B. Beaulieu, formerly manager of the Liquefied Gas Corp., of Seattle, and later stationed at Camp Roberts in California for several months, has been ordered "over-seas," according to word received from his wife.

Mr. Beaulieu has the rank of captain in the quartermaster corps.

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Specialized gas problems arising from war industry's specific needs are solved by Algas engineers.

Typical is the use of available by-product or waste gases—or a mixture of these with butane, propane, or other gases—to increase efficiency and lower costs.

Our engineering staff invites your inquiries.

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LOS ANGELES CHICAGO

THE QUALITY OF PAYNEHEAT EQUIPMENT IS STANDING USERS IN GOOD STEAD TODAY!

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Mobile Kitchens Serve 1500 Meals Daily

IN the course of visits made by Fred M. Jack, of Dallas, Texas, executive of United Artists, to cities and towns where government camps and projects were rapidly being constructed, he was impressed with the fact that there was not a sufficient number of clean and wholesome restaurants within reach of the workers, executives of the projects, and others.

As he gave thought to the problem it occurred to him to design, patent and construct the "Keep 'Em Eating" line of mobile restaurants shown in the accompanying pictures. There are at present five of these in operation at various government projects in Texas and priorities have already been granted for the construction of 20 more.

Cooking in the restaurants is of course done with butane. Ewing Butane Gas Co., of Dallas, engineered and installed the butane system, which consists of a 20-gal. and a 5-gal. Pressed Steel Tank Co. cylinder connected to an Orbon 4-burner hot plate and grill. The 5-gal. bottle is used as auxiliary supply when the larger cylinder is taken to the nearest source of supply for refilling.

The restaurants are towed to the projects where they are to be located, and placed on 50 x 50 ft. lots leased for the purpose, usually just outside the gates. There, with wheels removed, they are set up on blocks for as long a period as is desired, as a rule, until each project is completed. Then each one can be moved on for service elsewhere.

The overall dimensions of the restaurant is 8 x 30 ft. It is 7½ ft. high and weighs 3500 lbs. without equipment. The kitchen is 8 x 10 ft. in dimensions and accommodates in addition to cooking range and hot plate, a work board for making sandwiches, a cabinet for storing dishes, an ice box and a cabinet for storing supplies. One thousand sandwiches per day can be made in the kitchen.

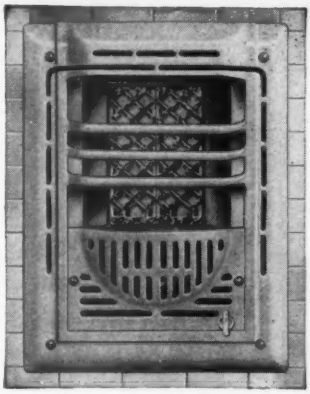
Using LP-Gas, this mobile restaurant serves workers in new war plants.

"A-TEN-SHUN!"

MR. DEALER: Order L-79 (revised) permits you to still sell NECESSARY heating equipment to regular customers, and, permits us to ship our dealers equipment for these customers. Most of our popular models are still available. Peerless high-quality standards have been maintained. Write your requirements.

No. 7602—Wall insert bathroom type in white porcelain enamel with heavy steel front. Available in other sizes.

No. 6485—Fireplace or room type in shaded copper tone effect finish. 5 double radiant size.



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Shipping Points: Seminole, Okla., Stonewall, Okla., St. Elmo, Ill.
WHOLESALE ONLY!

BUTANE
PROPANE

for all
requirements—
A superior quality
assured. Delivery by
rail or truck transport.

Clute Petroleum Company
National Bank of Tulsa Bldg.
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FOR *Sealing* THREADED JOINTS

ZERO-FLEX
JOINT COMPOUND

NEVER LEAKS!

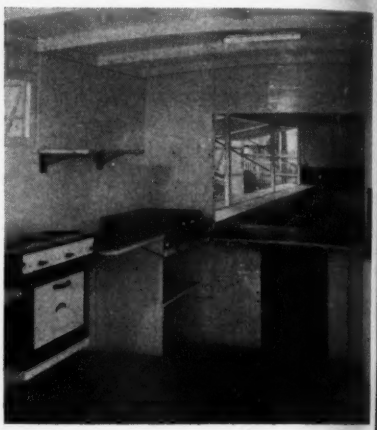
- ✓ NEVER DRIES NOR HARDENS
- ✓ A POSITIVE SEAL AT MINUS 55° TO 212° F.
- ✓ EASY WORKING AT ZERO
- ✓ NOT AFFECTED BY OIL OR GREASE. ALCOHOL, GLYCERIN OR BRINE

ORDER FROM KEROTEST

KEROTEST Manufacturing Co.
Pittsburgh, Penna.

With three people to wait on the counter, one to pick up bottles, a cook and a helper, 1500 people per day can be served.

The sides of the restaurant are hinged at the top and when opened form a canopy. The counter is also



Interior of kitchen specially designed for temporary locations.

hinged and when folded out is 24 in. wide. The butane tanks are placed in position at the front end, and on the outside, of the restaurant. Copper tubing extends to appliances.

There has been no problem of securing permission of the plumbing and heating division of the War Production Board to install butane in the restaurant due to the fact that meals are being provided defense workers and soldiers in army camps

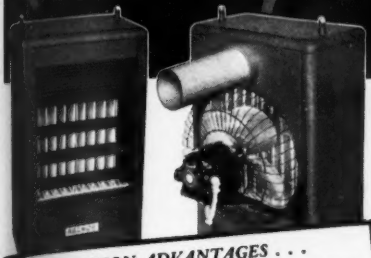
◆ ◆

Paul De Laya is President Of Hydrogas Fuel Co.

The Hydrogas Fuel Co. is now the name of the company that formerly operated under the title of Hydrogas Fuel and Equipment Corp. at 926 E. Commerce St., San Antonio, Texas. Paul DeLaya is president.

REZNOR GIVES YOU A GOOD HEATING PLANT

Quickly



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Far less installation time . . Requires fewer men . . Uses 89% less vital materials
BROAD PERFORMANCE . . .
Moves more air . . Moves air over wider areas . . Air circulation in summer
LOW COSTS . . .
Lower investment . . Lower maintenance cost . . No boiler room help . . Low fuel expense

Reznor Heaters operate with gas from a suspended position. They give ideal heating and ventilation in factories of all types and sizes. Whether it be for plant additions or for auxiliary heating and ventilation within existing properties, Reznor Unit Heaters offer benefits in installation time, floor space economy, and costs. One hundred and thirty-seven Army and Navy establishments and plants of countless war contractors use them. Reznor Heaters are available in all types and in a complete range of sizes. Write today for literature.

Reznor Mfg. Co., 304 James St., Mercer, Pa.

"GAS HEATERS EXCLUSIVELY SINCE 1888"

Wanted: A Billion Dollars a Month!

EVERYBODY EVERY PAYDAY 10%

America needs *your* help in encouraging employees to set aside 10% of your gross pay roll for War Bond purchases. For details of the Pay-Roll Savings Plan, approved by organized labor, write Treasury Department, Section U, 709 Twelfth St. NW., Washington, D. C.

IN WAR SAVINGS BONDS!

This space is a contribution to America's All-Out War Effort by
BUTANE-PROPANE *News*
1709 W. 8th St., Los Angeles, Calif.

C.N.G.A. Installs New Officers for Coming Year

The California Natural Gasoline Association has installed as its president for the coming year W. W. Robinson, Jr., of the Texas Co., Los Angeles, succeeding W. C. Dayhuff. R. W. Heath of Signal Oil & Gas Co., Los Angeles, was chosen vice president. Geo. L. Tyler has been reappointed secretary-treasurer.

In taking over his new duties, Mr. Robinson declared that in the change from peacetime to a war-time basis the natural gasoline industry has demonstrated that it is a wartime necessity.

Mr. Robinson stated that the natural gasoline industry is providing an uninterrupted flow of a petroleum commodity, portions of which are propane, butane and isobutane, which are vitally important in 100-octane aviation gasoline and synthetic rubber.

Committee chairmen appointed by Mr. Robinson include: R. W. Heath, Signal Oil & Gas Co., advisory; R. S. Tulin, Shell Oil Co., Inc., finance and budget; M. W. Smith, Bankline-Norwalk Co., auditing; Randal Maass, General Petroleum Corp., program; Ben C. Dumm, Allied Supply Co., entertainment; L. L. Bendlinger, Lomita Gasoline Co., membership; R. D. Gibbs, Union Oil Co., gas report; D. E. McFaddin, Union Oil Co., fall meeting; John H. Kunkel, publicity, and J. B. Taylor, Signal Oil & Gas Co., technical, with R. R. Crippen of Texas Co. vice chairman of the technical committee.

◆ ◆

Servel Refrigerator Aids Red Cross "Blood Bank"

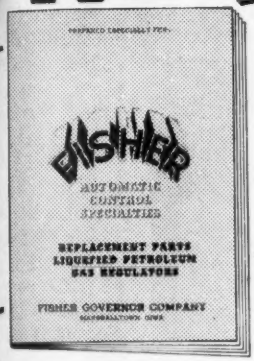
The campaign of the Buffalo, N. Y., Chapter of the American Red Cross to build up a "blood bank" in case of emergency, has a competent "worker" in the guise of a Servel Electrolux gas refrigerator.

One of these refrigerators is being used to store the donations of human blood which the Buffalo chapter recently called for in initiating its plan for a blood bank ready for emergency call.

After the blood is given at a Buffalo hospital, it is shipped to a plant where the liquid is withdrawn and the remaining solids are reduced to powdered form for storage until used.

Newly elected members of the board of directors of the California Natural Gasoline Association at their June dinner in Los Angeles.

FREE A COMPLETE SERVICE MANUAL FOR ALL FISHER L.P.G. REGULATORS



SEND FOR YOUR COPY NOW

Important to you and your customers—EFFICIENT MAINTENANCE — UNINTERRUPTED SERVICE — SATISFACTORY OPERATION of all Regulators now in use. This manual contains sectional drawings, parts lists, instructions and parts prices. It's designed to completely serve your maintenance needs.

FISHER GOVERNOR COMPANY
938 Fisher Building
MARSHALLTOWN, IOWA

No. 41-F-8123-X (illustrated)*

SPECIFICATIONS

Baking Oven	12¾" x 16" x 19"
Broiler	7¾" x 16" x 19"
Size of Cooking Top	9¼" x 18¾"
Height to Cooking Top	36"
Floor Space	36" x 26"
Shipping Weight, Approximately	240 Lbs.

VESTA LP-Gas Ranges

Are Ready To Serve

In the Fight for Victory workers are no less important than soldiers . . . vitamins no less essential than bullets. To work well the nation must be fed well . . . and in thousands of American kitchens loyal wives are cooking better and feeding better with dependable Vesta LP-Gas Ranges. Too, the savings in food and fuel through Vesta's cooking dependability is contributing to the conservation of vital products. For Victory, Vesta is Ready to Serve.

** By Government order, present ranges are not equipped with burner covers.*

ATHENS STOVE WORKS, INC.

ATHENS, TENNESSEE

SPRAGUE METERS

for

PROPANE - BUTANE SERVICE

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Write for Particulars

SPRAGUE METER COMPANY

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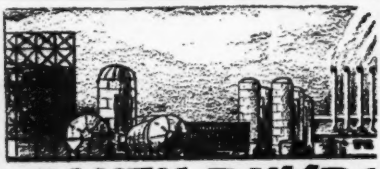

SMITH PUMPS Speed WAR PRODUCTION

When time means victory the pumping of fuel is an important factor. SMITH Butane-Propane PUMPS, designed to handle difficult non-lubricating fluids, are saving vital hours in the transfer of LP-Gas for war production. Models for every need.

SMITH *Precision Products* COMPANY
1135 MISSION ST. · SOUTH PASADENA, CALIF.

Col. W. F. Rockwell Heads A.G.A.E.M. for Coming Year

At the annual meeting of the Association of Gas Appliance and Equipment Manufacturers, held in Chicago on June 11, the following officers were elected to take office on Oct. 1 of this year: Col. W. F. Rockwell, Pittsburgh Equitable Meter Co., Pittsburgh, president; Lyle C. Harvey, the Bryant Heater Co., Cleveland, first vice president; D. P. O'Keefe, O'Keefe & Merritt Co., Los Angeles, second vice president, and John Van Norden, American Meter Co., New York City, treasurer. Col. Rockwell is now serving as director of production for the Maritime Commission in Washington and as a member of the executive committee of two war boards.

Col. W. F. Rockwell

◆ ◆

Exhausted Natural Gas Area Has Complete LP-Gas Service

Northwestern Natural Gas Co., Grandview, Wash., is now serving LP-Gas to the communities of Emerald, Prosser, Grandview, Sunnyside and Mabton, in southern Washington east of the Cascades, which formerly received natural gas from the Rattlesnake Hills wells before they became depleted, according to Hal Worth, company representative.

The natural gas lines have been removed and were recently sold to the Dulien Steel Products Co., of Seattle, for $75,000 which was turned over to Northwestern Natural for operating expenses. The former natural gas pipe will be used for defense work.

DEARBORN GAS HEATERS

The Quality Line with Outstanding

SELLING FEATURES

- **COOL CABINETS**
  REVOLUTIONARY SAFETY FEATURE
- **HI-CROWN BURNER**
  THE MIRACLE L.P.G. BURNER
- **BLUE FLAME PILOT**
  AUTOMATIC LIGHTING FOR SAFETY
- **RICH-WOODS FINISH**
  BEAUTY OF FINE WOOD. DURABLE
- **SIFONAIRE CHASSIS**
  PATENTED. NOTHING ELSE LIKE IT
- **A.G.A. APPROVAL**
  18 MODELS ALL L.P.G. APPROVED

DEARBORN STOVE COMPANY

3256 MILWAUKEE AVE., CHICAGO
3401 SO. GRAND AVE., LOS ANGELES

IN TEXAS IT'S
THE BUTANE COMPANY

for
WHOLESALE DELIVERIES DIRECT TO YOUR BULK STORAGE PLANT.

the BUTANE Company
• BROWNWOOD, TEXAS

WHOLESALE TRANSPORTERS—DISTRIBUTORS OF BUTANE

SINCLAIR PLANTS, DEDICATED TO U. S. WAR EFFORT

Until Victory is ours, the plants, products, facilities and energy of the Sinclair Prairie Oil Company are dedicated to the successful prosecution of the War.

Like steel, copper, aluminum and other vital materials, Butane and Propane are essential to the war effort. For home use of war workers; for power, heat and fuel in a thousand war-time industrial operations; for 100 Octane aviation gasoline; and now for the manufacture of synthetic rubber; Butane and Propane are fighting on the home front, as well as with our armed forces on land and sea and in the air.

And Sinclair dealers are playing their part in supplying these Sinclair products and in rendering intelligent, helpful service.

SINCLAIR PRAIRIE OIL COMPANY

Liquefied Petroleum Gas Division
Sinclair Building Tulsa, Oklahoma

Louisiana Dealers Successfully Sponsor New State Law

The Louisiana Butane Dealers Association prepared for introduction and sponsored through the Louisiana Legislature, at its regular 1942 biennial session, House Bill 112 which created the Louisiana Liquefied Petroleum Gas Commission, according to L. C. Parker, executive secretary of the Association.

Official ensignia of Louisiana Butane Dealers Assn., Inc.

Under this new law there will be a Commission of three members who will be charged with the supervision and regulation of the liquefied petroleum gas industry in Louisiana along the same lines as heretofore existed with the Louisiana Public Service Commission. One member will be elected by the bonded dealers of the State, one appointed by the Governor, and one will be the State Insurance Commissioner (now the Secretary of State). In the past the industry has been governed by the Public Service Commission, with W. P. Thomas as Director of the Gas Division.

The general appropriation bill carries an item for defraying the expenses of administering the act. The funds, however, will be provided from permit fees paid into the State Treasury by the bonded dealers throughout the State.

The new law provides that the new Commission shall have authority to call dealers before it for violations and to hold hearings thereon and to impose and collect fines when dealers are found guilty. It further provides that the permit fees shall be based upon the gross annual sales of the respective dealers, with a minimum fee of $50 and a maximum fee of $500.

House Bill 112 is now on the Governor's desk for signature, and will become effective the 20th day after the Legislature adjourns, which will be July 29.

◆ ◆

Servel Establishes All-Time Injury-Free Record

An all-time safety record for "continuous man-hours worked without a disabling injury" has been achieved by Servel, Inc., of Evansville, Ind. This was reported by the National Safety Council, Chicago, in a pamphlet recently published summarizing the past year's injury experience in the industry.

Classified in the Metal Furniture Manufacturing Industry, Servel is credited by the National Safety Council with leading this industry with a record of 4,125,924 injury-free man-hours of continuous operation.

Servel has consistently maintained a high safety record over the years and has been cited several times by the Safety Council. The safety work at Servel is one of the major interests of Louis Ruthenburg, president of the company.

◆ ◆

Merced County 4-H Clubs Use LP-Gas-Fired Camping Outfit

More than 300 4-H Club members of Merced County, California, attended that organization's annual summer camp in the Yosemite Valley, June 13-17. Five butane-equipped stoves took care of the cooking problems. Hot water tanks gave an ample supply of running hot water and three cooks and two dish washers planned and prepared well-balanced meals.

Order These Famous L. P. Gas Products From Us . . . .

RegO LAP GAS

The BASTIAN-BLESSING Co.

THE DAYTON-DOWD CO.

Hackney
BUTANE-PROPANE CYLINDERS

L.C. RONEY INC.

The IMPERIAL BRASS MFG. CO.

GAS EQUIPMENT CO., INC.
2620 South Ervay Street, Dallas, Texas
GAS EQUIPMENT SUPPLY CO.

AMERICAN

Dependable

BUTANE AND PROPANE TANKS

AMERICAN
PIPE & STEEL CORPORATION
Manufacturers and Distributors
ALHAMBRA CALIFORNIA

VICTORY IN 194..?
HOW YOU CAN HELP TO SHORTEN THE WAR

★

Keep your pumps on the job . . . delivering at top capacity. For greater War production in 1942 will advance the date ot Victory.

Write today for your free copy of the Viking Service Manual. It tells you how to get best per formance out of Viking Rotary Pumps . . . explains and pictures correct installation . . . suggests how some repairs and replacements may be avoided.

PRIORITY RATINGS . . PLEASE

Viking can supply pumps for War production work. It is absolutely necessary to give us your priority rating and allocation symbol. Be sure to obtain the highest rating possible. Priority regulations are changed frequently. Check up to see if changes made improve your rating. Thank you.

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VIKING PUMP COMPANY
CEDAR FALLS, IOWA

VALVES
and
Accessories
for
Gas Burning
Appliances
THE W. J. SCHOENBERGER CO.
CLEVELAND···OHIO

BU-PRO-FIRE
★
HEATERS AND
FLOOR FURNACES
FOR L. P. GASES
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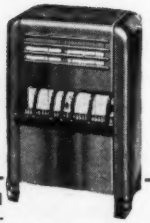


Bu-Pro-Fire Heaters and Floor Furnaces are designed and built especially for use with liquefied petroleum gases. Every Model is finished in "Lifetime" Porcelain Enamel and is guaranteed to give satisfactory Heating Service. A wide range of sizes provides a Model for every heating need. A. G. A. Approved. Write for illustrated catalog and prices.

TENNESSEE ENAMEL MFG. CO.
Nashville, Tennessee

Phillips Petroleum Co. Sends Gifts To 750 Employes In Arms

As a fitting celebration of its 25th birthday, the Phillips Petroleum Co., Bartlesville, Okla., dispatched to each of its 750 employes in the services a "birthday gift package" as a remembrance from the company. Each package contained 22 selected items of

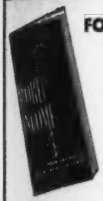
A boxful of surprises for Private W. A. Hey at Keesler Field, Miss., one of the 750 employes of the Phillips Petroleum Co. of Bartlesville, Okla., receiving a gift package of foodstuffs and toilet articles.

foodstuffs, candy, cigarettes, toilet articles and a current novel.

Frank Phillips, chairman of the company, declared in a statement to the staff:

"Those employes who are now in any branch of military service over the world, are, among other things, working for the preservation and future of the Phillips Petroleum Co. The company desires to remind them, in a small way, of our realization of this fact, every one of the 750 Phillips employes in the Nation's service being sent a separate birthday package. Thus we hope that, as these parcels are received, there will be 750 separate birthday celebrations all over the face of the globe, instead of just one celebration here on the home front."

ROBERTSHAW MANUALS
will help increase your sales



FOR DOMESTIC SALESMEN

"More Income from Gas Ranges"

How can your salesmen sell more gas ranges? This manual shows simply, graphically, convincingly. Thousands of salesmen have greeted it with enthusiasm, are putting it to effective use.

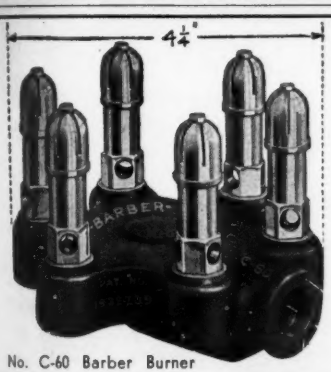
FOR COMMERCIAL SALESMEN

"Hidden Losses in Your Kitchen and How to Stop Them"

The latest developments in commercial gas cooking equipment are brought together in this manual, now used by many bottled gas dealers.

Write for free copies

ROBERTSHAW THERMOSTAT COMPANY
YOUNGWOOD, PA.



No. C-60 Barber Burner

BARBER APPLIANCE BURNERS

The burner is the heart of the appliance. Barber Burner Units are correctly designed, with the proper jets, to fit the individual appliance, and give complete combustion on Butane-Propane Gas. Appliance makers and fuel distributors assure better service and economy for their customers by recommending the use of Barber Burners. Submit your burner problems to us. Catalog of complete line on request.

THE BARBER GAS BURNER CO.
3704 Superior Ave. Cleveland, Ohio

FOR SPEED AND LASTING ACCURACY
Use SMITH BUTANE METERS

Don't tolerate constant small losses in metering Butane and other liquefied petroleum gases from dispensing racks and tank trucks. Such losses amount to big totals! Eliminate them by installing new, improved Smith Meters, precision-built on the exclusive Smith rotary principle of measuring by *positive displacement.* Only Smith Meters combine all these features:

1. Fast, steady flow.
2. Extremely low head loss.
3. Built-in strainer.
4. 250-pound working pressure.
5. Guaranteed sustained accuracy—no pistons or valves to wear.

Smith BU-40 Meters are built in models for corrosive and non-corrosive gases. Capacity, 50 g.p.m. Wide range of counter mechanisms. For complete details, write for Bulletin No. 123.

SMITH METER COMPANY
SUBSIDIARY OF A. O. SMITH CORPORATION
Factories at Los Angeles and Milwaukee

Sales Offices at
NEW YORK, CHICAGO, HOUSTON, LOS ANGELES

LOCAL STOCKS AT CONVENIENT POINTS
LOCAL AGENTS IN ALL PRINCIPAL CITIES

ANSWERS

To Chapter 13

The Bottled Gas Manual

Here are the answers to the questions on Page 35 and which refer to problems in Chapter 13 of THE BOTTLED GAS MANUAL:

1. A. What should the input be?
   B. Can the burner be converted?
   C. Can it be located properly?
   D. Will it be economical and satisfactory in operation?

2. 12 quarts of water = 3 gal.
   The weight of a gallon of water is 8.34 lbs.
   3 gals. of water would weigh 3 x 8.34 =25 lbs.
   The temperature rise desired is 212 — 60 = 152°.
   The specific heat of water is 1.
   Therefore:—
   25 x 152 x 1 = 3800 B.t.u. required to raise water through 152° in 10 minutes.
   10 minutes = 1/6 hour.
   6 x 3800 = 22,850 B.t.u. per hour rate of flow required to heat 25 lbs of water through 150° in 10 minutes time without consideration of efficiencies.
   As 22,850 B.t.u. hourly flow is what is required and the efficiency of the burner is 55%, therefore 22,850 must be 55%.
   1% would be 1/55 of 22,850 and 100% would be 100 times this, so $22{,}850 \times \frac{100}{55} = 41{,}600$ B.t.u. hourly required input.

3. Between a No. 52 MTD and a No. 51 MTD orifice. (See table of "Propane Orifice Capacities" in Chapter 12.)

4. The equation is B = D x W x 49.
   Substituting known values:
   B = 22 x 24 x 49
   B = 25,872 per hour.

5. The volume of the oven is 22 x 24 x 18 = 9504 cu. in.
   There are 1725 cu. in. to the cu. ft.
   The volume of the oven is therefore $\frac{9504}{1728} = 5.5$ cu. ft.
   The input for an oven of over 2.4 cu. ft. capacity with a heat control is 11,000 B.t.u. per cu. ft.
   11,000 x 5.5 = 60,500 B.t.u. per hour.

6. A. New burners.
   B. New offset gas cocks.
   C. Offset adapters.
   D. Raising rear end of burner only.

7. Because it may be put together with a compound that is soluble in propane and a leak may develop later.

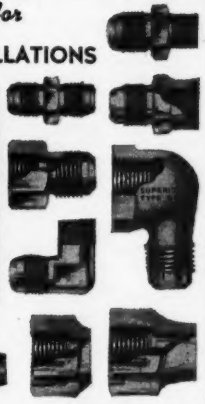
8. Drill to a No. 55 MTD hole, then ream slightly with a tapered reamer.

9. The internal cross section area of a 1 in. standard welded steel pipe is 0.864 sq. in. This should be at least 45% of the total port area. The total port area could therefore be
   $0.864 \times \frac{100}{45} = 1.92$ sq. in.
   The cross section area of a No. 32MTD port is .01057 sq. in. (See "Table of Recommended Burner Inputs per

Superior FLARE FITTINGS
Especially for
L. P. G. INSTALLATIONS

SAE (Flare) Unions, Couplings, Adapters, Elbows, Tees, Crosses and Nuts

Listed as Standard by
UNDERWRITERS LABORATORIES, INC.



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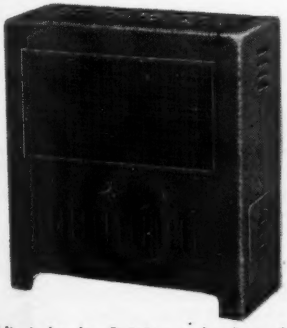

Write today for Catalog and prices of the BRILLIANT FIRE line of High Efficiency Gas Circulating Heaters.

The OHIO FOUNDRY
& MANUFACTURING CO.
Steubenville, Ohio

Thousands of salesmen still working for you!

★

Thousands of Florence L-P Gas Ranges are giving better cooking today to thousands of families lucky enough to have installed theirs before the emergency!

Every one of those Florence Ranges is *working* for you, building sound good will. For Mrs America loves her Florence and she doesn't keep that fact to herself! Florence dependability and outstanding performance are creating a greatly expanded demand for you when the war is over . . . they're working for you right now, too, for it's by *range* performance that your customers judge your *service*.

Naturally Florence is all-out for Victory today . . . but we pledge you even better, finer L-P Gas Ranges when that job is done!

★

Florence's capital, men, management and resources — a $30,000,000 production capacity! — are rapidly being converted entirely to important war work!

FLORENCE GAS RANGES
For L·P Gas
BACKED BY 70 YEARS' EXPERIENCE

FLORENCE STOVE COMPANY
Gardner, Mass.; Kankakee, Ill.; 1458-59 Merchandise Mart, Chicago; 45 E. 17th St., New York; 53 Alabama St., S.W., Atlanta; 301 N. Market Street, Dallas.

"KEEP 'EM FRYING"
USE PITCO
Frialators
REG. U.S. PAT. OFFICE
SAVE FAT . . . GAS . . . SPACE

Deep-Fat Frying at Its Best

★ Customers can serve a wider variety of fried foods.
★ Left-overs or by-products quickly converted into daily specials.
★ Increase in customer business means increase in the gas load.
★ Actual saving in fat alone more than pays total cost of gas required to operate them.

Send for 1942 Illustrated Catalog.

J. C. PITMAN & SONS,
INCORPORATED
711-719 Broad St. Lynn, Mass.

McNAMAR Tanks

- TRUCK TANKS
- TRANSPORTS
- SKID TANKS
- STORAGE TANKS
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All tanks ASME U-69, inspected by Ocean Accident & Guarantee Corp., Ltd

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Tulsa, Oklahoma · Salem, Illinois

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BLODGETT—MODEL 981—BAKE OVEN. 2 7" Sections—42" wide—32" deep. Oven control. Used one month. E. W. RUSSELL, Toms River, New Jersey.

Port Hole" in Chapter 12.)

$$\frac{1.92}{.01057} = 181 \text{ (plus) ports.}$$

10. The internal diameter of 1 in. standard welded steel pipe is 1.049 in. 6 x 1.049 = 6.294 in., length of mixing chamber.

◆ ◆

Auto and Oil Industries Set Up New Organization

Automobiles, airplanes, tractors, and other vehicles of the future will operate better because of the work of a new organization which will coordinate the research activities of the automotive, aeronautic, and petroleum industries.

The best combinations of fuels, lubricants, and equipment powered by internal combustion engines will be sought by the new group, the Cooperative Research Council. The council, which is sponsored by the American Petroleum Institute and the Society of Automotive Engineers will continue the work of the Cooperative Fuel Research Committee. The CFR committee has done effective research on fuel utilization for 21 years.

Pacific Coast Distributors for Bastian-Blessing L.P.G. Equipment • Dayton Dowd Pump Co.

International Distributors for Day & Night I.C.C. Cylinders

Manufacturers of Vapor Differential Compressors; Roney Valves & Fittings

LARGEST AND MOST EXPERIENCED MANUFACTURING ENGINEERS AND JOBBERS OF L. P. G. EQUIPMENT

Whatever the Need
Whatever the Problem
"WRITE RONEY"

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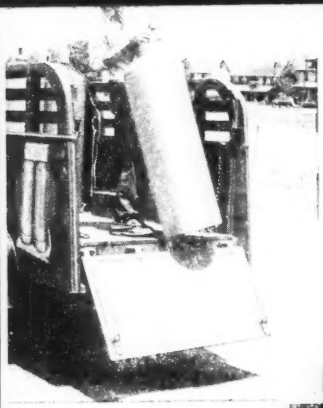

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